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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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PREVALENCE OF DISEASE

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PREVALENCE OF POLIOMYELITIS

For the week ended August 5, 1939, a total of 208 cases of poliomyelitis was reported in the United States, as compared with 177 for the preceding week and with 250 cases for the 1934–38 median for the corresponding week.

The incidence of poliomyelitis remained favorable throughout the country except for the States of California, Michigan, and South Carolina.

California reported 57 cases, as compared with 46 during the preceding week, Michigan 46 as compared with 29, and South Carolina 17 as compared with 12 cases.

PLAGUE IN THE WESTERN PART OF THE UNITED STATES

INFECTION IN RODENTS, EXPERIMENTAL TRANSMISSION BY FLEAS, AND INOCULATION TESTS FOR INFECTION*

By C. R. ESKEY, *Senior Surgeon*, and V. H. HAAS, *Passed Assistant Surgeon*, *United States Public Health Service*

Part I. Plague Infection of Rodents

The introduction and spread of wild rodent plague.—Within 10 years after plague was first discovered at the port of San Francisco in 1900, the infection was proved to exist among ground squirrels (*Citellus beecheyi*) in 9 California counties south of San Francisco Bay. This region remained the only known permanent focus of infection until 1934, when ground squirrel epizootics occurred in the Sierra Nevada Mountain areas of California, and a human case of plague was reported from the Great Basin region of Oregon.

Since 1934 extensive field investigations conducted by the United States Public Health Service and the health departments of 5 States have resulted in the discovery of foci of wild rodent plague in 9 of the far western States, exclusive of California. The infection has been found on the eastern slope of the Great Divide in two States but not in the Great Plains area east of the Rocky Mountains.

*Résumé of a comprehensive, detailed report that is to be published as a Public Health Bulletin.

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From the histories of wild rodent epizootics observed during the past 10 years and the location of recently discovered plague foci, as well as the occurrence of the severe type of epizootics that have been recently discovered in the more eastern foci, it would seem that wild rodent plague has been gradually extending eastward from the Pacific coast.

Wild rodents of one species or another find suitable conditions for their existence in all types of terrain found in the western States; consequently there have been no natural barriers to the spread of the infection. Whether or not the wild rodents inhabiting the region east of the Rocky Mountains will afford a suitable media for the continued dissemination of the infection over this territory is unknown at present.

That wild rodent plague may spread unnoticed over great areas unless intensive measures are taken to detect its presence may be explained by such factors as the dissemination of the disease through a rodent population of insufficient density to give rise to explosive epizootics, and the occurrence of epizootics among wild rodents having slight contact with man.

Plague among different kinds of wild rodents.—Thus far, plague infection has been demonstrated in nine species of ground squirrels. The infection has been disseminated to a greater extent by these animals than by any other wild rodents, because of their wide distribution, the overlapping of the ranges of different species, and the tendency of most species of ground squirrels to a communal existence in great numbers under proper conditions.

The round-tailed desert rats and white-tailed prairie dogs have been found to suffer from severe epizootics and to play an important part in the dissemination of the infection in the regions they inhabit.

Plague has been found a number of times among chipmunks and marmots in regions where ground squirrels were also known to be infected. It is likely that both chipmunks and marmots are of importance in maintaining limited reservoirs of the infection.

In a few instances tree squirrels and native mice have been found to be involved in the plague outbreaks of localities where active spread of the infection was occurring among other wild rodents.[1]

Domestic rat infestation.—West of the Rocky Mountains domestic rats are found only in communities on the Pacific coast, in the valleys of formerly navigable rivers, and a few other isolated places. This absence of domestic rats from most of the territory where wild rodent plague has been demonstrated to exist greatly reduces the hazard to human beings.

[1] Since this was written a plague-infected kangaroo rat was shot in New Mexico and a dead plague-infected cottontail rabbit was found in the State of Washington.

Part II. Flea Investigations

OBSERVATIONS ON THE ECOLOGY OF FLEAS

Flea infestation of wild rodents.—In the course of field surveys that have been conducted in the 11 far Western States, fleas have been collected from over 30,000 small wild animals, chiefly rodents, and the average number of each flea species per animal has been determined for all kinds of hosts. The flea infestation of different kinds of wild rodents varied greatly as regards both the species and the number of fleas per animal. Over 50 different species of fleas have been found on the western rodents. Some of the larger rodents were found to harbor excessive numbers of fleas, as in the case of the California ground squirrels, which averaged over 20 of these parasites per animal, and the marmots, with an average of over 10 fleas each, while there were other rodents that did not yield an average of 1 per animal. Certain rodents naturally harbored only 1 species of fleas, whereas others were the normal hosts for several species, but the latter animals, in most cases, did not harbor a greater number of fleas than those infested with only 1 or 2 species.

Host preference of fleas.—All species of wild rodent fleas were found to have a certain degree of host preference, which in the case of most flea species limited their natural hosts to one species of rodent or to certain rodent groups that were closely related biologically. In spite of this selectivity in their natural hosts, surveys showed that some interchange in fleas constantly occurs between all kinds of wild rodents inhabiting the same region and thus having environmental contact.

Existence of fleas apart from their hosts.—During the course of field investigations many wild rodent fleas were observed on the surface of the ground near burrow openings, in the burrow runs, and in excavated nests. Therefore, in estimating the number of fleas using wild rodents as hosts, those parasites present in the environmental surroundings should be taken into consideration as well as those that may be obtained from the bodies of the hosts.

The excavated nests of wild rodents which acted as hosts for different species of fleas were found to yield varying proportions of fleas in relation to the numbers which were obtained from the bodies of the animals using the nests; that is, the ratio of nest infestation to host infestation varied in the case of different species of fleas. From this it was concluded that some species of fleas exist apart from their hosts to a greater extent than others, thus explaining in part the small number of fleas found infesting certain kinds of rodents.

Although fleas may naturally live apart from their hosts for short periods, they probably do not exist very long in nests that have been abandoned, for fleas were not found in many excavated nests which failed to show evidence of recent occupation.

Experimental procedure.—In order to gain some knowledge regarding the ability of the more prevalent species of western fleas to act as vectors of plague, laboratory experiments in the flea transmission of plague were conducted with 31 species, consisting of 25 obtained from wild rodents and their nests, 3 from domestic rats, and 3 from miscellaneous animals. The wild rodent fleas included many species found on hosts that have been implicated in the spread of plague, while others were obtained from rodents among which no evidence of infection has been discovered. These experiments were conducted with individual fleas which were housed in separate test tubes, and a complete record was kept of every insect from the time it was collected until its death.

Fleas were exposed to infection by feeding them on plague-infected guinea pigs when the animals appeared to be so sick that they could live only a short time. In order to determine which of the exposed fleas were plague infected or which harbored *Pasteurella pestis* in the gastrointestinal tract, 18-hour bouillon cultures of the feces were inoculated into guinea pigs about 5 days following exposure. The feces of fleas which failed to be infectious to guinea pigs the first time were tested again, and, if the second test was negative, the parasites were again fed on infected guinea pigs. Some fleas were exposed to infection 6 or 7 times before plague organisms were demonstrated in the feces. These feces tests were made at intervals during the life of infected fleas to determine whether or not they continued to excrete virulent organisms.

Fleas were placed in contact with guinea pigs every other day until plague organisms were found in their feces; after that they were afforded a chance to feed every day. If a flea did not attempt to feed within 1 minute, it was removed from the abdomen of the guinea pig.

After death, each flea was examined microscopically to determine its species and sex, and for evidence of plague infection. The bodies of all fleas used in the experiments were inoculated into guinea pigs.

Infectiousness of guinea pigs' blood for fleas.—In attempting to infect fleas with plague, 5,793 feedings were given on 247 guinea pigs. Although all of these animals were very sick when used as hosts, 40 percent of them failed to infect a single one of the fleas that ingested their blood. None of the guinea pigs that lived over 42 hours after fleas had fed on them were infectious and few fleas were infected by animals that survived over 18 hours. Only 70 percent of the infected hosts which died in less than 18 hours after exposure of fleas were found to have infected one or more parasites.

The infectiousness of plague-infected guinea pigs' blood was found to bear a close relationship to the degree of bacteriemia as shown by

heart blood cultures and smears. No flea was infected by blood which failed to show the presence of *P. pestis* in cultures. Fleas were fed on 30 guinea pigs whose blood was found to contain *P. pestis* upon culture and on 9 animals from which positive smears were obtained, without any of the exposed parasites being infected. Only 32 percent of fleas were plague infected by the ingestion of blood which was found to contain 10 or more organisms in each microscopic field of smear preparations, while less than 17 percent flea infection resulted from blood found to contain *P. pestis* upon culture but in which no organisms were observed in the smears.

The virulence of the infection in the guinea pig hosts had little effect in determining the infectiousness of their blood by flea feeding, as the percentage of exposed fleas that were infected was about the same regardless of whether the guinea pigs died 3 or 4 days after inoculation or whether they lived for 7 or 8 days.

The results obtained in the experiments on the infection of fleas by feeding on guinea pigs suggest that, under natural conditions, fleas are rarely infected by animals which recover from plague or suffer from a chronic form of the disease. From this it would seem that fleas would not be infected by hosts that have a certain amount of natural immunity to plague.

Plague infection of different species of fleas.—During this investigation 635 female and 259 male fleas were found to excrete virulent plague organisms in their feces after having fed on infected guinea pigs. Infection followed in 25 percent of exposures to guinea pigs whose blood was infectious to one or more fleas fed on them. Fleas of 31 species were infected, which included all species that were properly tested. As a great many guinea pigs had to be used for infecting fleas, the percentage of infection of each flea species during these experiments did not afford very reliable data for comparing the susceptibility to infection of the different species, because feeding the same species of fleas on different guinea pigs, all of which were known to have a high degree of septicemia, resulted in varying proportions of flea infection by the blood of the different animals. Most of the wild rodent fleas seemed to be as readily infected as domestic rat fleas. Both sexes were equally susceptible to infection.

The number of fleas of each species infected with plague during these experiments and their usual hosts were as follows:

Flea	*Host*
140 *Xenopsylla cheopis* (Roth 1903)	Domestic rats.
51 *Nosopsyllus fasciatus* (Boxe 1801)	Do.
5 *Leptopsylla segnis* (Schen 1816)	Do.
19 *Diamanus montanus* (Baker 1895)	Ground squirrels.
5 *Hoplopsyllus anomalus* (Baker 1904)	Do.
6 *Thrassis petiolatus* (Baker 1904)	Do.
178 *Opisocrostis labis* (J & R 1922)	Do.

Flea	Host
58 *Thrassis pandorae* (Jell. 1937)	Domestic rats.
3 *Oropsylla rupestris* (Jord. 1929)	Do.
15 *Oropsylla idahoensis* (Baker 1904)	Do.
21 *Thrassis francisi* (Fox 1927)	Do.
58 *Thrassis arizonensis* (Baker 1898)	Desert ground squirrels.
7 *Thrassis gladiolis* (Jord. 1925)	Do.
10 *Opisocrostis tuberculatus* (Baker 1904)	Ground squirrels and prairie dogs.
70 *Opisocrostis hirsutus* (Baker 1895)	Prairie dogs.
8 *Thrassis (acamantis) acamantis* (Roth 1905)	Marmots.
6 *Thrassis (acamantis) howelli* (Jord. 1925)	Do.
31 *Monopsyllus eumolpi* (Roth 1905)	Chipmunks.
9 *Monopsyllus ciliatus* (Baker 1904)	Do.
81 *Orchopeas sexdentatus* (Baker 1904)	Wood rats.
9 *Anomiopsyllus mudatus* (Baker 1898)	Do.
6 *Megarthroglossus longispinus* (Baker 1895)	Do.
74 *Malareus telchinum* (Roth 1905)	Native mice.
13 *Catallagia wymani* (Fox 1909)	Do.
2 *Monopsyllus wagneri* (Baker 1904)	Do.
1 *Atyphloceras multidentatus* (Fox 1909)	Do.
2 *Hystrichopsylla dippiei* (Roth 1902)	Miscellaneous.
2 *Neopsylla inopina* (Roth 1915)	Ground squirrels.
1 *Hoplopsyllus affinis* (Baker 1904)	Rabbits.
2 *Ctenocephalides felis* (Bouche 1935)	Cats, etc.
1 *Pulex irritans* (Linn 1758)	Dogs, man, etc.

Disappearance of the infection from fleas.—Most of the fleas that were found to excrete virulent *P. pestis* in their feces after exposure to infection continued to harbor the organisms in their gastrointestinal tracts until death. Some fleas, however, ceased to excrete organisms and the inoculation of their dead bodies failed to produce the disease in guinea pigs. This tendency of fleas to become free from infection varied to some extent for the different species of fleas, as only 4 percent of *X. cheopis* became uninfected, as compared to 12 to 19 percent of a number of other species.

Transmission of plague by fleas.—A total of 81 fleas, 70 females and 11 males, transmitted plague to 165 guinea pigs during these experiments. Individual fleas of several species infected more than one guinea pig and one, a male wild rodent flea, transmitted the disease to 11 animals. In proportion to the number of fleas infected, equal numbers of the 2 domestic rat species acted as vectors, and on this basis some of the wild rodent species were equally as effective vectors. Some species of fleas, particularly those with vestigial eyes and the rabbit and cat fleas, did not survive long enough in the laboratory to determine whether or not they were capable of being vectors. Of all the fleas tested, only one species, *M. telchinum* from *Microtus* (native mice), could be definitely considered as incapable of transmitting plague or at least very feeble vectors, because not one of 74 plague-infected fleas of this species transmitted the infection to guinea pigs.

These fleas lived as long in the laboratory as species which infected guinea pigs.

The following table lists the number of each species of fleas that transmitted plague, with their usual hosts and the number of guinea pigs to which they transmitted the disease.

Flea	*Host*
28 *X. cheopis* infected 59 guinea pigs	Domestic rats.
10 *N. fasciatus* infected 17 guinea pigs	Do.
2 *D. montanus* infected 3 guinea pigs	Ground squirrels.
1 *H. anomalus* infected 1 guinea pig	Do.
6 *T. pandorae* infected 15 guinea pigs	Do.
14 *O. labis* infected 35 guinea pigs	Do.
2 *O. rupestris* infected 6 guinea pigs	Do.
4 *T. francisi* infected 8 guinea pigs	Do.
3 *T. arizonensis* infected 5 guinea pigs	Do.
1 *O. tuberculatus* infected 1 guinea pig	Do.
3 *O. hirsutus* infected 4 guinea pigs	Prairie dogs.
1 *T. acamantis* infected 1 guinea pig	Marmots.
1 *T. howelli* infected 2 guinea pigs	Do.
2 *M. eumolpi* infected 4 guinea pigs	Chipmunks.
3 *O. sexdentatus* infected 4 guinea pigs	Native rats.

Period during which fleas were infectious.—The average length of life of fleas after they first transmitted plague was 3.2 days. For fleas of different species there was not much variation from this average. Nearly half of the fleas which transmitted plague were dead in less than 48 hours following their first infectious bite. A few fleas survived for over a week. The bites of a number of fleas that lived several days after transmitting the disease to one guinea pig were not infectious to any other animals.

Extrinsic incubation of plague in fleas.—It was found that a certain period must elapse for the extrinsic incubation of the infection in the gastrointestinal tracts of fleas before the bites were infectious. During these experiments this interval varied from 5 to 130 days. It varied both in the case of fleas of the same species as well as in those of different species. For example, the extrinsic incubation in *X. cheopis* varied from 5 to 31 days, with an average of 21 days, at a mean temperature of 66° F., while in the case of *N. fasciatus* this period varied from 6 to 116 days, with an average of 41 days. The extrinsic incubation of the infection in wild rodent fleas was very similar to that of *N. fasciatus*, with the average of some species being somewhat less than for the domestic rat fleas.

The average length of the extrinsic incubation period of plague in *X. cheopis* which were kept in an incubator at 72° to 80° F. was 15 days, or 6 days less than in the case of this species kept at a mean temperature of 66° F. Therefore, it would seem that an increase in temperature may reduce the length of the extrinsic incubation period of plague in these fleas.

Other factors being about equal, the difference in the length of the extrinsic incubation period of plague in different species of fleas must be considered as being of the greatest importance in determining their efficiency as vectors. Certainly the time that elapses from infection until transmission will determine the rapidity with which any species of fleas will spread the infection among their rodent hosts. Furthermore, the longer the extrinsic incubation period, the less likelihood there is of the fleas surviving the conditions of their environment to transmit the infection.

Length of life of plague-infected fleas.—These experiments demonstrated that fleas of many species may harbor virulent plague organisms in their gastrointestinal tracts for long periods without ill effects. The domestic rat fleas, *X. cheopis*, died in a shorter time after infection than any other species which thrived well in the laboratory. The average length of life of most other species of fleas was from 1 to 3 months, with some fleas surviving for maximum periods of 3 to over 5 months. The long life of many of the wild rodent fleas which harbored *P. pestis* explains the manner by which plague may be carried over from one active season to another in hibernating animals.

Plague-infected *X. cheopis* kept at a mean temperature of 66° F. survived for an average of 17 days, while those kept in an incubator at 72° to 80° F. lived an average of only 12 days, thus indicating that increased temperatures shorten the life of plague-infected fleas of this species.

Mechanism of plague transmission by fleas.—Throughout these experiments plague transmission by fleas was due to regurgitation of blood from the esophagus as described by Bacot and Martin, for mass formations which obstructed the flow of ingested blood to the stomach were observed in all of the parasites that transmitted the disease. In a number of instances regurgitated blood was seen to exude from the mouth parts of fleas upon their withdrawal from the skin.

Most normal fleas seldom fed longer than 4 minutes at one time and would rarely attempt to feed more frequently than once in 24 to 72 hours, depending on the species and temperature. As blood cannot enter the stomachs of fleas with blocked passages and they eventually die of starvation, the efforts of such fleas to feed were usually characteristic in that they would remain attached for abnormally long periods at one site or would shift from one place to another one or more times before temporarily ceasing their efforts to satisfy their hunger. Furthermore, fleas with blocked passages would generally try to feed as often as every hour or two during the day if placed in contact with guinea pigs. In some cases abnormal feedings such as those just described resulted from a partial obstruction permitting some blood to enter the stomach, or a temporary obstruction that would disappear during later efforts to feed. Regardless of the manner

in which fleas fed, a positive diagnosis of complete blockage could be made only by microscopic examination.

A few fleas transmitted plague when the duration of the infectious bite was less than 2 minutes, but as a general rule the more persistent the efforts of blocked fleas to feed, the greater was the likelihood of the bites being infectious.

However, a great many fleas that fed in a typical manner indicating blockage failed to transmit plague because regurgitation did not occur or because organisms were not carried into the wound. There is also a possibility that in some instances the organisms became so attenuated that they were not pathogenic.

Development of plague infection in fleas.—Microscopical studies were made of the gastrointestinal tracts of normal and plague-infected fleas by mounting both dead and live parasites in a drop of water under a cover glass. The development of plague masses was followed by examining live fleas at different intervals. Obstructing masses were usually clearly visible in both dead and live insects, but the outlines of the masses during their earlier stages could not be definitely distinguished except in stomachs which were distended with clear red blood. This necessitated the making of examinations immediately after fleas had fed.

Within a few days after the ingestion of *P. pestis*, dark-brownish masses were observed to form either in the proventriculi or in the stomachs of the infected fleas. Those originating in the proventriculi developed to the point where they caused obstruction within a few days to 3 weeks after infection of the fleas. These masses often invaded the esophagus before complete blockage occurred. In some instances blood passed into the stomach when the masses had caused considerable dilatation of the proventriculus. The mass formations which developed primarily in the stomachs varied greatly in size, number, and shape. During the early stages there were usually a number of small granular masses formed in the stomach. These masses tended to form in groups that were joined together by a fine weblike membrane, and they also coalesced, forming one large mass or two or more medium-sized ones. In some fleas the masses became so large that they nearly filled the stomach within a month or two after infection of the fleas. In other cases the masses were relatively small after 3 or 4 months. Blockage from a mass formed in the stomach did not occur until it invaded the narrow tubular opening between the proventriculus and stomach, or, more commonly, not until it had involved the proventriculus. This forward extension of the stomach masses with the development of obstruction appeared to be more or less accidental and occurred sometimes within a month or sometimes not for several months after infection of the fleas. The

masses in the stomach moved about as foreign bodies and had no connection with the stomach walls.

During this study it was observed that plague masses originated primarily in the proventriculi of *X. cheopis* more frequently than in the case of all other species of fleas tested, thus accounting for the shorter extrinsic incubation period of the infection in *X. cheopis*.

Typical obstructing masses were seen in a great many fleas of nearly all species that did not transmit plague in the laboratory.

Small plague masses were composed almost entirely of bipolar cocco-bacilli, while the larger and older masses had a large central core of amorphous, cohesive, dark-brown material, and the organisms were limited to a narrow outer zone surrounding the amorphous core. Bipolar organisms were also present in smears made of any fluid present in the stomachs containing masses.

In a number of instances, small mass formations exactly like those present in the stomach were seen in the intestines and rectal pouch, which would indicate that complete discharge of small masses may take place at times and fleas thus may become free from infection.

Infectiousness of flea feces.—By inoculating guinea pigs subcutaneously with 18-hour bouillon cultures of the feces deposited by fleas in test tubes, from 80 to 90 percent of the test animals were infected in the case of most species of fleas if they harbored *P. pestis* in the gastrointestinal tracts. When inoculations were made at intervals of a few days, two consecutive negative reactions were sufficient to prove that fleas which had been exposed to infection did not harbor plague organisms and that fleas which had previously been found to excrete organisms had become free from infection. Such tests of the feces present in test tubes at the time fleas died gave a slightly greater percentage of positive results than the inoculation of the bodies of the parasites. It was found that plague organisms might survive in dried feces as long as 5 weeks at room temperature.

Thirty experimental attempts were made to infect guinea pigs by rubbing into the scarified skin both freshly deposited and dry feces of fleas which were known to have been plague infected without the development of the disease in a single animal. Therefore it would seem unlikely that plague is contracted naturally to any extent through the medium of infected feces deposited on the skin.

PLAGUE INFECTION OF GUINEA PIGS BY FLEAS

Reaction at the site of the infectious bite.—Characteristic skin reactions developed at the site of infectious flea bites in about 90 percent of infected guinea pigs. These lesions first appeared as small macules, sometimes as early as 18 hours after the bite, and formed papules in about 24 hours. A small gray granule formed in the apex of the

papule that sloughed out, forming an ulcer if the animals lived long enough. During the papular stage the lymph glands on the same side became greatly enlarged.

Virulence of flea-transmitted infection.—All but 4 guinea pigs infected by fleas died from the infection, some in 3 and 4 days and over half of them in 7 days or less. The virulence of the infection in guinea pigs was not affected by the time that elasped from infection of the fleas until they transmitted the disease.

WILD RODENT INFESTATION WITH DIFFERENT SPECIES OF FLEAS WHICH TRANSMITTED PLAGUE IN THE LABORATORY

Fleas which transmitted plague in the laboratory included nearly all of the most prevalent species found on wild rodents which have been implicated in the spread of the infection in all regions where plague foci have been discovered, and also 2 species whose natural hosts have not yet been found to be involved in the dissemination of the disease.

In the following summary are listed the different wild rodents which were found to be infested with fleas that acted as laboratory vectors of plague, with the species of fleas indicated for each kind of rodent, and with notation on the occurrence of plague among the different animals. Many of these wild rodents harbored other species of fleas which are not mentioned because they have not been proved capable of being vectors.

GROUND SQUIRRELS

Citellus beecheyi are ground squirrels among which plague has existed for many years in California, and they act as natural hosts for *Diamanus montanus* and *Hoplopsyllus anomalus.*

Citellus grammurus, or rock squirrels, have been implicated in plague outbreaks in central Utah and western New Mexico. They also act as natural hosts for *D. montanus* and *H. anomalus.*

Citellus columbianus have been found plague infected in Wallowa County, Oregon, where they are infested with *Thrassis pandorae* and *Opisocrostis tuberculatus.*

Citellus oregonus have been involved in plague epizootics in northern California, eastern Oregon, and northern Nevada. They act as hosts for *Thrassis francisi, Thrassis pandorae,* and *Opisocrostis tuberculatus* in these regions.

Citellus townsendi have suffered from plague epizootics in eastern Washington where they are infested with *Opisocrostis tuberculatus* besides two other species of fleas.

Citellus richardsoni have been found plague infected in southwestern Montana, where they harbor *Oropsylla rupestris, Thrassis pandorae, Opisocrostis labis,* and *Opisocrostis tuberculatus.*

Citellus armatus and *Citellus elegans* have overlapping ranges in southwestern Montana, eastern Idaho, southwestern Wyoming, and northern Utah, where many infected animals of each species have been discovered. They act as hosts in these regions for *Oropsylla rupestris*, *Thrassis pandorae*, *Opisocrostis labis*, and *Opisocrostis tuberculatus*.

Callospermophilus are the mantled ground squirrels found in mountainous areas. They have been found plague infected only in the Sierra Nevada Mountains of California where the most prevalent fleas present on them were *Diamanus montanus* whose natural hosts are *Citellus beecheyi*.

Citellus mollis act as natural hosts for *Thrassis francisi* which transmitted plague in the laboratory, but no evidence of infection has been discovered among their natural hosts.

Ammospermophilus leucurus, or desert antelope ground squirrels, and other desert squirrels are normal hosts of *Thrassis arizonensis* that acted as laboratory vectors and yet their hosts have not been found to be involved in the spread of plague.

PRAIRIE DOGS

Cynomys parvidens have been found plague infected in south central Utah where they were infested with *Opisocrostis hirsutus*, *Hoplopsyllus anomalus*, and *Thrassis francisi*.

Cynomys leucurus have been found to harbor infected fleas in southwestern Wyoming, where their fleas included *Opisocrostis hirsutus*, *Thrassis pandorae*, *Opisocrostis labis*, and *Opisocrostis tuberculatus*.

Cynomys gunnisoni zuniensis have been found to suffer from decimating epizootics of plague in Catron County, N. Mex., and in eastern Arizona. In Catron County, N. Mex., *Opisocrostis hirsutus* was the only parasite found on prairie dogs, while in Arizona other species of fleas were present.

MARMOTS

Marmota flaviventris have been demonstrated as being involved in the spread of plague by three positive inoculations of parasites and one of tissue from a sick animal in three different regions where plague was known to involve ground squirrels. These rodents act as the natural hosts for *Thrassis* (*acamantis*) *acamantis* and *Thrassis* (*acamantis*) *howelli*.

CHIPMUNKS

Eutamias, or western chipmunks, have been found plague infected only in areas of the Sierra Nevada Mountains where the infection involved other rodents as well. However, *Monopsyllus eumolpi* are found on chipmunks throughout the West.

NATIVE RATS

Neotoma, or wood rats, have been definitely implicated in the dissemination of plague in arid regions of southern Nevada and southern Utah and these rodents are infested with *Orchopeas sexdentatus* throughout the Western States.

SUMMARY

Fleas of 31 species were found to excrete virulent *P. pestis* in their feces after having fed on plague-infected guinea pigs and most of these fleas continued to harbor the organisms until they died. A total of 81 individual fleas, comprising 2 species from domestic rats and 13 species from wild rodents, transmitted plague by their bites to 165 guinea pigs after an extrinsic incubation period of the infection in the parasites which varied from 5 to 130 days. Species of wild rodent fleas which transmitted plague in the laboratory included the most prevalent species found infesting the different kinds of wild rodents among which plague has been demonstrated to exist in the far Western States.

Part III. Demonstration of Plague Infection by Inoculation of Parasites

Adoption of parasite inoculations as a routine procedure.—It has been known for many years that laboratory animals may be infected with plague when inoculated with the bodies of plague-infected fleas, but the use of parasite inoculations has not been adopted as a routine measure for demonstrating the existence of plague among rodent hosts. In 1936, following the demonstration of plague infection of fleas collected from ground squirrels in northern Nevada, the Public Health Service adopted the use of parasite inoculations, which included fleas, lice, and ticks as a routine procedure in surveys being conducted to locate foci of wild rodent plague.

Choice of a pulicide for plague surveys.—It was accidently discovered that fleas infected with plague in the laboratory were less likely to be infectious to inoculated guinea pigs when the parasites were killed with chloroform than when they died naturally. Following this observation, experiments were undertaken to test the effects of chloroform, ether, and hydrocyanic acid gas on cultures of *P. pestis*, as a result of which it was found that chloroform and ether in saturated atmospheres were capable of destroying the organisms and that the bacteria were attenuated by exposures of over 15 minutes to chloroform, while hydrocyanic acid gas caused only slight and variable reduction in virulence. Therefore, the cyanide gas was substituted for chloroform as a pulicide for killing parasites before attempting to collect them from their hosts in the field. Since this substitution was made, parasites obtained in areas where plague was present have given a greater percentage of positive reactions upon inoculation than during the time when chloroform was employed as a pulicide.

Preservation of P. pestis *in fleas.*—It was demonstrated in the laboratory that *P. pestis* harbored by dead plague-infected fleas might survive and retain their virulence for several months when stored in a refrigerator, and that a temperature of 98° F. destroyed the infectiousness of such fleas in 7 days. However, it has not been found necessary to refrigerate parasites in conducting field investigations provided they are shipped to the laboratory daily as collected.

Secondary infection following flea inoculations.—The inoculation tests of parasites, being an unsterile procedure, has at times produced secondary infections which obscured all evidence of the possible presence of *P. pestis* in the inoculated material. Of a number of different solutions tested in the laboratory, 2 percent salt solution proved to be the best medium for inhibiting the growth of secondary bacteria and for preventing the putrefaction of fleas without a deleterious action on *P. pestis* during storage of the insects, and this solution has been employed for over 2 years in shipping parasites from the field to the laboratory.

Inoculation of parasites.—Upon arrival of parasite specimens at the laboratory, the fleas, lice, and ticks are separated, counted, emulsified in physiological salt solution, and inoculated subcutaneously into guinea pigs. If a specimen contains a great many fleas they are usually divided into lots of 50 for inoculation. By dividing the fleas for the inoculation tests it was found possible to gain some idea of the number of infected fleas among the parasites collected from a group of animals.

During the past 3 years 4,161 inoculation tests were made of 212,000 parasites, of which nearly 200,000 were fleas. Plague infection of the test animals followed 96 pooled inoculations of fleas, 6 inoculations of lice, and 2 inoculations of ticks. There were a great many instances in which flea infection was demonstrated, while lice and ticks taken from the same groups of animal hosts were found not to harbor plague organisms. On the other hand, one inoculation of ticks and one of lice caused plague infection of the test animals when the fleas which were obtained from the same hosts were not found to be infectious.

Diagnostic value of flea inoculation tests.—In determining the existence of plague among wild rodents the inoculation of fleas has proved to be a much more sensitive test than dependence upon the discovery of plague-infected animals as indicated by the fact that since the flea tests were adopted plague has been demonstrated 96 times by this means and only 56 times by the inoculation of animal tissues. Even in areas where severe epizootics were in progress and it was possible to find dead plague-infected rodents, flea inoculations gave a greater number of positive results than inoculations of tissue. Plague-infected fleas have been obtained in 8 areas where infected animals have not yet been encountered, and, furthermore, the evidence

of plague being present among certain species of wild rodents has depended entirely upon collecting infected fleas from them. Had no effort been made to find infected animals during these investigations the results would have been practically the same, but if flea inoculation tests had not been used, many foci of infection would not have been discovered.

Comparison of the factors involved in parasite and tissue tests.—In comparing the value of parasite inoculations with animal tissue tests as a means for detecting plague, the following factors should be considered:

1. Parasites do not require refrigeration during shipment.

2. Persons engaged in collecting parasites for inoculation do not require the training necessary to detect macroscopic lesions of plague.

3. Infected fleas are likely to be obtained from animals during the early inapparent stages of the disease and from those having lesions that escape notice at autopsy.

4. Experience has demonstrated that infected fleas can be secured from rodents after epizootics subside and during enzootics when it is practically impossible to find infected animals.

5. As fleas may harbor *P. pestis* for weeks and months before their bites are infectious, it is possible for healthy animals to be infested with plague-infected fleas.

6. Even one infected flea in any lot tested will not escape inoculation while in pooled inoculations of tissue that portion that is infected may not be used in the fraction inoculated.

Use of flea inoculations during urban outbreaks.—During urban campaigns to control plague outbreaks, parasite inoculations would probably be of great value for locating infected foci during the seasonal quiescence of domestic rat epizootics and for determining when the rat infection had ended.

Summary.—During the past 3 years it has been definitely established that the inoculation of guinea pigs with parasites, particularly fleas, collected from wild rodents is preferable to depending upon the discovery of plague-infected animals as a means for determining the existence of foci of wild rodent infection.

OBSERVATIONS ON AN INFECTIOUS AGENT FROM *AMBLYOMMA MACULATUM*[1]

By R. R. PARKER, *Director, Rocky Mountain Laboratory,* GLEN M. KOHLS, *Assistant Entomologist, United States Public Health Service,* GEORGE W. COX, *Executive Officer, Texas State Department of Public Health,* and GORDON E. DAVIS, *Bacteriologist, United States Public Health Service*

During the late summer of 1937, two strains of an infectious agent pathogenic for guinea pigs were isolated from ticks of the species *Amblyomma maculatum* Koch, collected near Cleveland, Liberty County, Texas. These ticks were tested incident to a survey of the local tick population for the possible presence of agents of human disease. The survey was undertaken jointly by the Rocky Mountain Laboratory of the National Institute of Health and the Texas State Department of Health following the local occurrence of illnesses diagnosed as Rocky Mountain spotted fever. None of the other ticks tested show conclusive evidence of the occurrence of pathogenic agents: 123 *Dermacentor variabilis,* 4,064 *Amblyomma americanum,* and 33 *Rhipicephalus sanguineus.*

The two strains of this infectious agent were isolated from groups of 19 and 28 *A. maculatum,* respectively, collected from cows. One strain was not maintained beyond the first transfer. The data regarding recovery of the other strain are as follows: The 19 ticks concerned were triturated in 5 cc. of physiological saline and 2 guinea pigs each received 2 cc. of the resultant suspension, one subcutaneously, the other intraperitoneally. The former showed low fever on the first, second, fourth, and eighteenth days and was immune to the homologous agent injected on the twenty-second day. The latter was febrile on the first, fourth, and fifth days. On the fifth day there was a slight scrotal edema and reddening and the animal was sacrificed. The spleen was enlarged 3 times, the parietal and visceral tunicae were adherent toward the anterior poles of the testes, and the latter were injected. Transfer was made to 8 guinea pigs intraperitoneally, 6 receiving 1 cc. each of ground spleen tissue, and two 2 cc. each of testicular washings (tunica exudate in physiological salt solution). The spleen-injected animals remained afebrile and were later immune to a western Montana strain of Rocky Mountain spotted fever virus. Both guinea pigs that received testicular washings became febrile and had swollen, reddened scrota. They were sacrificed on the sixth and ninth days, respectively, and showed the same extensive involvement of the genital tissues as did the sacrificed tick-injected guinea pig.

[1] Contribution from the Rocky Mountain Laboratory, Division of Infectious Diseases, National Institute of Health.

Transfers were made from both, 12 guinea pigs receiving testicular washings and 4 brain tissue. All of the former became frankly infected, with findings as described above; all the latter remained afebrile, and were later found to be susceptible to a known strain of boutonneuse fever virus.

Two strain lines were started from the former group and have subsequently been maintained by testicular washings transferred intraperitoneally from animals sacrificed usually on the second day of fever. Frequent broth and agar cultures of heart blood of passage guinea pigs have consistently been bacteriologically negative.

This infection, as thus far observed in over 1,500 passage and experimental male guinea pigs, has exhibited the following characters. Usually there is fever and edema and reddening of the scrotum, but occasionally animals are afebrile either with or without external scrotal lesions. The scrotal discoloration is bright, like that of endemic typhus or boutonneuse fever, and seldom becomes dusky as is usual in guinea pigs infected with *Dermacentor andersoni* strains of Rocky Mountain spotted fever. The incubation period is usually from 3 to 6 days, rarely more or less, and is most often 4 or 5. The period of fever ranges from 1 to 4 days, and the maximum temperature from 39.8° C. to 41.0° C., but it is commonly 40.6° C. or lower. It seldom exceeds 40.0° C. if the febrile period is only 1 or 2 days. The scrotal edema and reddening, which varies from very slight to quite marked, generally appears on the first or second day of fever, is rarely delayed till the third, and lasts from 1 to 8 days. It may persist from 1 to 5 days after the temperature has returned to normal. The testes may become immovable within the scrotal sac, but frequently do not. Animals with typical scrotal involvement, when sacrificed on the sixth to ninth days, show a spleen 1.5 to 3 times enlarged with the malpighian corpuscles distinct. The tunica vaginalis is slightly to deeply injected, usually with exudate. The testes occasionally become hemorrhagic, but rarely the polar fat. The visceral and parietal tunicae may be definitely adherent, and the adhesion at times extends well forward and may even involve the entire testis. Sometimes the latter is completely covered by organized exudate.

With continued guinea pig passage the agent has apparently become less virulent. For several months, passage and experimental animals have seldom had more than 1 or 2 days of low fever, and infection has frequently been inapparent. The involvement of the genital tissues has become much less marked.

Thus far it has proved impossible to maintain the infection in passage guinea pigs by any other inoculum than testicular washings. As thus maintained the infection in guinea pigs is definitely mild. There have been no fatalities and infected animals do not appear ill.

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The causative agent is rickettsia-like and is present sparsely in smears of tunica exudate. Its morphology is more comparable to that of rickettsiae of the Rocky Mountain spotted fever group than to that of those of the typhus group. It has been cultivated in the embryonic tissues of developing chicks by Associate Bacteriologist Herald R. Cox of the Rocky Mountain Laboratory.

The relationship of this infection to several known rickettsial infections has been studied and the results of numerous cross immunity and other tests suggest some degree of relationship to boutonneuse fever, Rocky Mountain spotted fever, and endemic typhus. There is perfect reciprocal cross immunity between this disease and both Rocky Mountain spotted fever and boutonneuse fever (several strains of both have been used), and there is usually at least partial cross immunity with endemic typhus. The temperature curve differs from that of each of these diseases in that it is shorter, the temperature is lower, and the highest fever has consistently been on the first or second day of the febrile period. Rocky Mountain spotted fever vaccine confers, at most, a very slight degree of protection against the *maculatum* agent. Repeated attempts to recover the agent from the brain of acutely ill or recovered guinea pigs, as can be done in endemic typhus, have all given negative results.

SUMMARY

A rickettsia-like infectious agent mildly pathogenic for guinea pigs has been recovered from *Amblyomma maculatum* collected near Cleveland, Texas. As observed in male guinea pigs, there is usually a characteristic temperature curve and edema and reddening of the scrotum, but infection is sometimes inapparent. There is complete cross immunity between this infection and both Rocky Mountain spotted fever and boutonneuse fever, but with endemic typhus the degree of cross immunity is less consistent. However, it agrees with none of these diseases in all particulars.

REPORT ON MARKET-MILK SUPPLIES OF CERTAIN URBAN COMMUNITIES

Compliance of the Market-Milk Supplies of Certain Urban Communities With the Grade A Pasteurized and Grade A Raw Milk Requirements of the Public Health Service Milk Ordinance and Code, as Shown by Compliance (Not Safety) Ratings of 90 Percent or More Reported by the State Milk-Sanitation Authorities During the Period July 1, 1937, to June 30, 1939

The accompanying list gives the twelfth semiannual revision of the list of certain urban communities in which the pasteurized market milk is both produced and pasteurized in accordance with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code and in which the raw market milk sold to the final consumer is produced in accordance with the Grade A raw milk requirements of said ordinance and code, as shown by ratings of 90 percent or more reported by State milk-sanitation authorities.

These ratings are not a complete measure of safety but represent the degree of compliance with the Grade A requirements of the Public Health Service Milk Ordinance and Code. Safety estimates should also take into account the percentage of milk pasteurized, which is given in the following tables.

The primary reason for publishing such lists from time to time is to encourage the communities of the United States to attain and maintain a high level of excellence in the public health control of milk supplies

It is emphasized that the Public Health Service does not intend to imply that only those communities on the list are provided with high-grade milk supplies. Some communities which have high-grade milk supplies are not included because arrangements have not been made for the determination of their ratings by the State milk-sanitation authority. In other cases the ratings which have been determined are now more than 2 years old and have therefore lapsed. In still other communities with high-grade milk supplies there seems, in the opinion of the community, to be no local necessity nor desire for rating or inclusion in the list, nor any reasonable local benefit to be derived therefrom.

The rules under which a community is included in this list are as follows:

(1) All ratings must have been determined by the State milk-sanitation authority in accordance with the Public Health Service rating method, based upon the Grade A pasteurized milk and the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code.

(2) No community will be included in the list unless both its pasteurized milk and its raw milk ratings are 90 percent or more.

Communities in which only raw milk is sold will be included if the raw milk ratings are 90 percent or more.

(3) The rating used will be the latest rating submitted to the Public Health Service, but no rating will be used which is more than 2 years old.

(4) The Public Health Service will make occasional surprise check surveys of cities for which ratings of 90 percent or more have been reported by the State. If such surprise check rating is less than 90 percent but not less than 85, the city will be removed from the 90-percent list after 6 months unless a resurvey submitted by the State during this probationary interim shows a rating of 90 percent or more. If, however, such surprise check rating is less than 85 percent, the city will be removed from the list immediately.

Communities are urgently advised to bring their ordinances up to date at least every 5 years, since ratings will be made on the basis of later editions if those adopted locally are more than 5 years old.

Communities which are not now on the list and desire to be rated should request the State milk-sanitation authority to determine their ratings and, if necessary, should improve their status sufficiently to merit inclusion in the list.

Communities which are now on the list should not permit their ratings to lapse, as ratings more than 2 years old cannot be used.

Communities which have not adopted the Public Health Service Milk Ordinance may wish to give thoughtful consideration to the advisability of doing so. It is obviously easier to satisfy the requirements upon which the rating method is based if these are included in the local legislation.

Communities which are enforcing the Public Health Service Milk Ordinance, but which have not yet been admitted to the list, should determine whether this has been the result of failure to enforce the ordinance strictly or failure to bring the ordinance up to date.

State milk-sanitation authorities which are not now equipped to determine municipal ratings are urged, in fairness to their communities, to equip themselves as soon as possible. The personnel required is small, as in most States one milk specialist is sufficient for the work.

The inclusion of a community in this list means that the pasteurized milk sold in the community, if any, is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A pasteurized milk is 90 percent or more and that, similarly, the raw milk sold in the community, if any, so nearly meets the requirements that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A raw milk is 90 percent or more. However, high-grade pasteurized milk is safer than high-grade raw milk, because of the added protection of pasteurization. To secure

this added protection, those who are dependent on raw milk can pasteurize the milk at home in the following simple manner: Heat the milk over a hot flame to 155° F., stirring constantly; then immediately place the vessel in cold water and continue stirring until cool.

TABLE 1.—*Communities in which all market milk is pasteurized. In these communities market milk complies with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized milk ratings of 90 percent or more* [1]

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
ILLINOIS			MISSOURI		
Elgin	100	Dec. 14, 1938	St. Louis	100	June 1938
Evanston	100	May 10, 1938	NORTH CAROLINA		
Glencoe	100	May 13, 1938	Andrews	100	Sept. 26, 1938
Highland Park	100	Do.	Clinton	100	July 27, 1938
Kenilworth	100	Do.	Draper	100	Aug. 17, 1938
Lake Bluff	100	Do.	Fort Bragg	100	July 27, 1938
Lake Forest	100	Do.	Tarboro	100	Nov. 1, 1938
Waukegan	100	May 16, 1938			
Winnetka	100	May 13, 1938			
MINNESOTA					
Albert Lea	100	Sept. 29, 1938			
Rochester	100	October, 1938			
Winona	100	Aug. 12, 1938			

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables. This percentage is an important factor to consider in estimating the safety of a city's milk supply.

TABLE 2.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more* [1]

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed. See text for home method]

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
ALABAMA			ILLINOIS		
Dothan	49	June 21, 1938	Chicago	99.9	May 20, 1939
Huntsville	80	Dec. 7, 1938	Decatur	87	Jan. 28, 1939
Montgomery	27	Mar. 15, 1939	KANSAS		
ARKANSAS			Fort Scott	46	June 1939
El Dorado	40	June 1938	Kansas City	51	December 1938
Fayetteville	59	May 1939	Lawrence	61	January 1938
Fort Smith	38	June 1939	Leavenworth	77	December 1938
Jonesboro	37	May 1939	Ottawa	13	January 1938.
Little Rock	44	October 1938	Salina	58	Do.
Pine Bluff	28	June 1939	Topeka	48	December 1937
Texarkana	35	Sept. 1938	Wichita	69	November 1937
FLORIDA			KENTUCKY		
Miami Beach	93	May 12, 1938	Glasgow	68	June 27, 1939
Pensacola	20	June 9, 1938	Louisville	97	July 1938
GEORGIA					
Americus	13	June 21, 1939			

See footnote at end of table.

TABLE 2.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more*—Continued

NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed. See text for home method]

Community	Percentage of milk pasteurized	Date of rating
MINNESOTA		
Austin	77	May 19, 1938
Little Falls	64	Dec. 1, 1937
MISSISSIPPI		
Greenville	58	May 25, 1939
McComb	21	Dec. 6, 1938
Tupelo	21	Jan. 6, 1939
MISSOURI		
Clayton	99.9	June 1938
Ferguson	80	Do.
Kirkwood	94	Do.
University City	99.6	Do.
Webster Groves	93	Do.
NEW MEXICO		
Albuquerque	71	Nov. 10, 1938
Deming	12	October 1937
Las Vegas	56	July 20, 1938
NORTH CAROLINA		
Asheville	67	June 23, 1938
Burlington	87	Jan. 1, 1938
Elizabethtown	65	Sept. 1, 1937
Fayetteville	49	July 27, 1938
Franklin	73	Sept. 29, 1938
Goldsboro	39	Apr. 18, 1938
Greensboro	75	Oct. 1938
Hendersonville	53	Sept. 13, 1938
High Point	85	Dec. 1937
Hope Mills	64	July 27, 1938
Leaksville	53	Aug. 16, 1938
Lexington	60	Dec. 8, 1938
Mount Airy	47	Oct. 18, 1938
Pilot Mountain	54	Oct. 19, 1938
Reidsville	69	Aug. 18, 1938
Rocky Mount	50	Nov. 29, 1938
Salisbury	57	Oct. 6, 1938
Winston-Salem	61	Nov. 1938
OHIO		
Athens	84	Oct. 6, 1938
OKLAHOMA		
Ada	62	Sept. 16, 1938
Bartlesville	42	Dec. 20, 1937
Blackwell	34	May 10, 1938
Lawton	47	Feb. 22, 1939
Muskogee	70	Mar. 16, 1938
Oklahoma City	73	Mar. 29, 1939
OKLAHOMA—continued		
Okmulgee	55	Apr. 20, 1938
Tulsa	74	Apr. 1939
OREGON		
Astoria	64	June 16, 1939
Portland	80	July 2, 1938
TENNESSEE		
Clinton	75	June 9, 1938
TEXAS		
Abilene	67	Apr. 25, 1939
Amarillo	73	Oct. 17, 1938
Ballinger	49	Apr. 21, 1939
Bay City	28	Mar. 3, 1939
Big Spring	34	Sept. 20, 1938
Corpus Christi	87	May 26, 1939
Dallas	77	Dec. 10, 1938
Fort Worth	75	Feb. 25, 1939
Gainesville	63	June 30, 1939
Galveston	77	Feb. 4, 1939
Henderson	47	May 24, 1939
Lamesa	48	May 4, 1939
Nacogdoches	68	May 26, 1939
San Antonio	79	Sept. 9, 1938
Seguin	12	July 30, 1938
Sherman	43	June 17, 1939
Texarkana	26	Oct. 25, 1938
Tyler	49	Apr. 14, 1939
Waco	48	Mar. 30, 1939
UTAH		
Salt Lake City	96	Mar. 31, 1938
VIRGINIA		
Pulaski	33	July 6, 1938
South Boston	77	July 11, 1938
Williamsburg	41	May 3, 1939
WASHINGTON		
Camas	8	May 22, 1939
Vancouver	31	May 25, 1939
Walla Walla	33	Apr. 14, 1939
Yakima	67	Apr. 20, 1939
WEST VIRGINIA		
Huntington	66	June 5, 1939
WYOMING		
Casper	71	Aug. 17, 1938
Cheyenne	74	July 7, 1938

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables. This percentage is an important factor to consider in estimating the safety of a city's milk supply.

TABLE 3.—*Communities in which no market milk is pasteurized, but in which the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by raw milk ratings of 90 percent or more* [1]

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed. See text for home method]

Community	Date of rating
KANSAS	
Horton	January 1938
Neodesha	April 1939
MISSISSIPPI	
Canton	Oct. 17, 1938
Greenwood	Nov. 22, 1938
Hollandale	Nov. 30, 1938
Holly Springs	Jan. 4, 1939
Leland	Nov. 30, 1938
Magnolia	Dec. 6, 1938
Ocean Springs	Dec. 29, 1937
Yazoo City	Oct. 12, 1938
NEW MEXICO	
Raton	Dec. 21, 1937
NORTH CAROLINA	
Ahoskie	Oct. 20, 1938
Aulander	Nov. 8, 1938
Belhaven	Oct. 26, 1938
Bladenboro	Sept. 1, 1937
Clarkton	Do.
Colerain	Nov. 8, 1938
Edenton	Nov. 7, 1938
Elkin	Oct. 19, 1938
Fremont	Feb. 2, 1938
Kelford	Nov. 8, 1938
Lewiston	Do.
Mars Hill	Feb. 21, 1939
Mount Holly	Oct. 28, 1937
Mount Olive	Feb. 2, 1938
Murfreesboro	Oct. 20, 1938
North Wilkesboro	July 29, 1938
Powellsville	Nov. 8, 1938
NORTH CAROLINA—continued	
Roxobel	Nov. 8, 1938
Spray	Aug. 17, 1938
Tabor City	Mar. 30, 1938
Wilkesboro	July 29, 1938
Windsor	Nov. 8, 1938
Woodville	Do.
OKLAHOMA	
Hobart	Jan. 19, 1938
Kingfisher	Nov. 22, 1937
SOUTH CAROLINA	
Hartsville	Mar. 30, 1938
TENNESSEE	
Knox County	June 7, 1938
Savannah	Apr. 22, 1938
TEXAS	
Canyon	Oct. 14, 1938
Colorado	May 10, 1939
Commerce	Mar. 16, 1939
Del Rio	Apr. 20, 1939
Kermit	Sept. 12, 1938
VIRGINIA	
Boydton	Apr. 26, 1939
WEST VIRGINIA	
Grantsville	June 7, 1939

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables. This percentage is an important factor to consider in estimating the safety of a city's milk supply.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period January–June 1939

There is printed herewith a list of publications of the United States Public Health Service issued during the period January–June 1939.

The purpose of the publication of this list is to provide a complete and continuing record of Public Health Service publications, for reference use by librarians, scientific workers, and others interested in particular fields of public health work, and not to offer the publications for indiscriminate free public distribution.

These current lists of publications will be issued in limited numbers as separates, which will be made available for selected distribution to scientific personnel and librarians who have a special need for them and who may find it desirable to bring together in one file a complete list of Service publications.

Those publications marked with an asterisk (*) can be obtained only by purchase from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the prices noted.

Periodicals

*Public Health Reports (weekly), January–June, vol. 54, nos. 1 to 26, pages 1 to 1194. 5 cents a number.

*Venereal Disease Information (monthly), January–June, vol. 20, nos. 1 to 6, pages 1 to 184. 5 cents a number.

Reprints From the Public Health Reports

2019. The health of the Nation. By Thomas Parran. January 6, 1939. 7 pages.

2020. Nonindustrial injuries among male and female industrial employees. By Hugh P. Brinton. January 6, 1939. 12 pages.

2021. Undergraduate engineering training in public health and related activities in engineering colleges of the United States. By Arthur P. Miller. January 13, 1939. 7 pages.

2022. Evaluation of odor nuisance in the manufacture of kraft paper. By J. M. DallaValle and H. C. Dudley. January 13, 1939. 9 pages.

2023. Amblyomma philipi—A new tick from Texas and Mexico, with a key to known species of Amblyomma in the United States. (Acarina: Ixodidae). By R. A. Cooley and Glen M. Kohls. January 13, 1939. 4 pages; 2 plates.

2024. Basal metabolism tests on disturbed patients. By C. K. Himmelsbach and Othilia T. Mertes. January 20, 1939. 4 pages.

2025. Do case records guide the nursing service? By Mayhew Derryberry. January 20, 1939. 11 pages.

2026. Studies in chemotherapy. VIII. Some toxic effects of repeated administration of sulfanilamide and sulfanilyl sulfanilamide ("di-sulfanilamide") to rabbits and chickens. By Sanford M. Rosenthal. January 27, 1939. 12 pages.

2027. Histopathological changes in hens and rabbits following administration of sulfanilamide and sulfanilyl sulfanilamide (di-sulfanilamide). By A. A. Nelson. January 27, 1939. 21 pages; 3 plates.

2028. The protein tyrosin reaction. A biochemical diagnostic test for malaria. By H. O. Proske and Robert B. Watson. February 3, 1939. 15 pages.

2029. Chronic ulcerative cecitis in the rat. By Benjamin F. Jones and Harold L. Stewart. February 3, 1939. 4 pages.

2030. Report on market-milk supplies of certain urban communities. Compliance of the market-milk supplies of certain urban communities with the Grade A pasteurized and Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code, as shown by compliance (not safety) ratings of 90 percent or more reported by the State milk-sanitation authorities during the period January 1, 1937, to December 31, 1938. February 3, 1939. 5 pages.

2031. An epidemiological study of poliomyelitis in the District of Columbia. By C. C. Dauer. February 10, 1939. 8 pages.

2032. Mottled enamel in South Dakota. By H. Trendley Dean, Elias Elvove, and Richard F. Poston. February 10, 1939. 16 pages.

2033. The effect of artificial temperatures on stability of neoarsphenamine. By T. F. Probey and W. T. Harrison. February 10, 1939. 5 pages.

2034. The formol-gel reaction in rheumatic fever: an aid in the diagnosis of active carditis. By Mark P. Schultz and Edythe J. Rose. February 17, 1939. 16 pages.

2035. The concentration of glutathione in the erythrocytes of patients with rheumatic fever. By Mark P. Schultz. February 17, 1939. 5 pages.

2036. Public Health Service publications. A list of publications issued during the period July–December 1938. February 3, 1939. 6 pages.

2037. Studies of the acute diarrheal diseases. I. Differential culture media. By A. V. Hardy, James Watt, T. M. DeCapito, and Maxwell H. Kolodny. February 24, 1939. 14 pages.

2038. Clegg's amoeba culture method for growing Mycobacterium leprae. By Florence L. Evans. February 24, 1939. 5 pages.

2039. Glucose tolerance in rheumatic fever. By Mark P. Schultz. February 24 1939. 6 pages.

2040. Preventive clinic facilities available in 94 selected counties of the United States. By Anthony J. Borowski and Margaret Lovell Plumley. March 3, 1939. 8 pages.

2041. The catalytic potency of the blood in rheumatic fever. By Mark P. Schultz and Edythe J. Rose. March 3, 1939. 10 pages.

2042. A study of quartz-fusing operations with special reference to the measurement and control of silica fumes. By Edward C. Riley and J. M. DallaValle. March 3, 1939. 8 pages.

2043. The association between rheumatic fever and exophthalmic goiter. By Mark P. Schultz. March 10, 1939. 8 pages.

2044. Breast and lung carcinoma in "A" stock mice. By John J. Bittner. March 10, 1939. 13 pages.

2045. The complement fixation reaction of Lleras in leprosy. By Sam H. Black and Hilary Ross. March 10, 1939. 8 pages.

2046. Mouth lesions associated with dietary deficiencies in monkeys. By N. H. Topping and H. F. Fraser. March 17, 1939. 16 pages; 4 plates.

2047. Oral pathology in monkeys in various experimental dietary deficiencies. By T. H. Tomlinson, Jr. March 17, 1939. 8 pages; 3 plates.

2048. A study of experimental pertussis in the young rat. By J. W. Hornibrook and L. L. Ashburn. March 17, 1939. 6 pages; 3 plates.

2049. Disabling sickness and nonindustrial injuries among drivers and other employees of certain bus and cab companies, 1930–34, inclusive. By Hugh P. Brinton. March 24, 1939. 10 pages.

2050. Studies of sewage purification. IX. Total purification, oxidation, adsorption, and synthesis of nutrient substrates by activated sludge. By C. C. Ruchhoft, C. T. Butterfield, P. D. McNamee, and Elsie Wattie. March 24, 1939. 29 pages.

2051. Engineering problems in milk sanitation. By Leslie C. Frank. March 31, 1939. 14 pages; 2 plates.

2052. Induction of carditis by the treatment of infected guinea pigs with insulin. By Mark P. Schultz and Edythe J. Rose. March 31, 1939. 6 pages; 3 plates.

2053. Insects found on aircraft at Miami, Fla., in 1938. By E. V. Welch. April 7, 1939. 6 pages.

2054. Studies on oxyuriasis. XIX. Examinations of children in a private nursery school over an 18-month period. By Eloise B. Cram and M. O. Nolan. April 7, 1939. 8 pages.

2055. A simple device for sampling air-borne bacteria. By Alexander Hollaender and J. M. DallaValle. April 7, 1939. 4 pages; 1 plate.

2056. The antigenic and synergistic action of a toxic serum extract of hemolytic streptococci. By Mark P. Schultz and Edythe J. Rose. April 14, 1939. 12 pages.

2057. Silicosis and lead poisoning among pottery workers. Summary of report of study made in West Virginia. April 14, 1939. 4 pages.

2058. Frequency of dental services among 9,000 families, based on Nation-wide periodic canvasses 1928–31. By Selwyn D. Collins. April 21, 1939. 29 pages.

2059. The evolution of disseminated bacterial infection in guinea pigs. Influence of treatment with insulin and phloridzin. By Mark P. Schultz and Edythe J. Rose. April 21, 1939. 6 pages.

2060. Lymphocytic choriomeningitis. Report of two cases, with recovery of the virus from gray mice (Mus musculus) trapped in the two infected households. By Charles Armstrong and Lewis K. Sweet. April 28, 1939. 12 pages.

2061. Maternal mortality in rural and urban areas. By Harold F. Dorn. April 28, 1939. 8 pages.

2062. Disabling industrial morbidity, third and fourth quarters of 1938 and the entire year. By William M. Gafafer. April 28, 1939. 6 pages.

2063. The effectiveness of certain types of commercial air filters against bacteria (B. subtilis). By J. M. DallaValle and Alexander Hollaender. April 28, 1939. 6 pages.

2064. Aquatic life in waters polluted by acid mine waste. By James B. Lackey. May 5, 1939. 8 pages.

2065. Biological products. Establishments licensed for the propagation and sale of viruses, serums, toxins, and analogous products. May 5, 1939. 6 pages.

2066. What people ask about health. By Robert Olesen. May 12, 1939. 26 pages.

2067. Report of three cases of ariboflavinosis. By J. W. Oden, L. H. Oden, Jr., and W. H. Sebrell. May 12, 1939. 4 pages.

2068. Sylvatic plague: studies of predatory and scavenger birds in relation to its epidemiology. By William L. Jellison. May 12, 1939. 8 pages.

2069. Organized public nursing and variation of field programs in 94 selected counties. By Joseph W. Mountin and Evelyn Flook. May 19, 1939. 12 pages.

2070. Maternal services in Michigan with special reference to economic status. By Jennie C. Goddard and Carroll E. Palmer. May 19, 1939. 16 pages.

2071. Notes on the fleas of prairie dogs, with the description of a new subspecies. By William L. Jellison. May 19, 1939. 6 pages.

2072. Prevalence of poliomyelitis in the United States in 1938. By C. C. Dauer. May 26, 1939. 6 pages.

2073. Domestic water and dental caries, including certain epidemiological aspects of oral L. acidophilus. By H. Trendley Dean, Philip Jay, Francis A. Arnold, Jr., Frank J. McClure, and Elias Elvove. May 26, 1939. 26 pages.

2074. Studies of sewage purification. X. Changes in characteristics of activated sludge induced by variations in applied load. By C. C. Ruchhoft and R. S. Smith. June 2, 1939. 16 pages.

2075. A study of human sera antibodies capable of neutralizing the virus of lymphocytic choriomeningitis. By Jerald G. Wooley, Fred D. Stimpert, John F. Kessel, and Charles Armstrong. June 2, 1939. 6 pages.

2076. Acute response of guinea pigs to the inhalation of dimethyl ketone (acetone) vapor in air. By H. Specht, J. W. Miller, and P. J. Valaer. June 2, 1939. 12 pages.
2077. Analysis of 5,116 deaths reported as due to acute coronary occlusion in Philadelphia, 1933–1937. By O. F. Hedley. June 9, 1939. 42 pages.
2078. Smallpox vaccination: a comparison of vaccines and techniques. By Ralph V. Ellis and Ruth E. Boynton. June 9, 1939. 14 pages.
2079. Influence of castration on the induction of subcutaneous tumors in mice of the C_3H strain by 1:2:5:6-dibenzanthracene. By Harold L. Stewart. June 9, 1939. 6 pages.
2080. Studies on immunizing substances in pneumococci. IX. Cutaneous tests in nonimmunized and immunized individuals in relationship to serum antibody content. By Lloyd D. Felton and Perry Franklin Prather. June 16, 1939. 18 pages.
2081. Rocky Mountain spotted fever. Protective value for guinea pigs of vaccine prepared from rickettsiae cultivated in embryonic chick tissues. By Herald R. Cox. June 16, 1939. 8 pages.
2082. The preservation of lymphocytic choriomeningitis and St. Louis encephalitis viruses by freezing and drying in vacuo. By Jerald G. Wooley. June 16, 1939. 2 pages.
2083. The significance of dust counts. By J. M. DallaValle. June 23, 1939. 10 pages.
2084. Studies of the acute diarrheal diseases. II. Parasitological observations. By Bertha Kaplan Spector, A. V. Hardy, and Mary Graham Mack. June 23, 1939. 10 pages.
2085. Breast cancer in breeding and virgin "A" and "B" stock female mice and their hybrids. By John J. Bittner. June 23, 1939. 6 pages.

Supplements to the Public Health Reports

147. The notifiable diseases. Prevalence during 1937 in States. 1939. 12 pages.
148. Measles. By R. D. Wright. 1938. 6 pages.
149. Good teeth. By F. C. Cady and John W. Knutson. 1939. 6 pages.
150. What every person should know about milk. By Leslie C. Frank. 1939. 11 pages.
153. Marital status of delinquents in relationship to Rorschach test scores. By M. J. Pescor. 1939. 6 pages.

Public Health Bulletins

244. Silicosis and lead poisoning among pottery workers. By Robert H. Flinn, Waldemar C. Dreessen, Thomas I. Edwards, Edward C. Riley, J. J. Bloomfield, R. R. Sayers, John F. Cadden, and S. C. Rothman. February 1939. 178 pages; 78 figures (48 halftones; 30 line cuts).
245. Milk supplies and their control in American urban communities of over 1,000 population in 1936. By A. W. Fuchs and L. C. Frank. December 1938. 70 pages.
246. Dermatitis and coexisting fungous infections among plate printers. By Paul A. Neal and C. W. Emmonds. April 1939. 56 pages; 6 halftones.

National Institute of Health Bulletins

171. The genera Dermacentor and Otocentor (Ixodidae) in the United States, with studies in variation. By R. A. Cooley. December 1938. 89 pages; 21 plates; 9 lithographs.

Unnumbered Publications

Index to Public Health Reports, volume 53, part 2, July–December 1938. 28 pages.

National Negro Health Week program. This pamphlet is published annually, usually about the middle of March, for community leaders in an effort to suggest ways and means by which interested individuals and organizations may be organized for a concerted and effective attack upon the community's disease problems. Twenty-fifth observance, April 1–30, 1939. 12 pages.

*National Negro Health Week poster. Twenty-fifth observance. 1939. Out of print.

National Negro Health Week leaflet. Twenty-fifth observance. 1939. 2 pages.

Annual Report

*Annual Report of the Surgeon General of the United States Public Health Service for the fiscal year 1938. 184 pages. Out of print.

Reprints From Venereal Disease Information

97. Direct costs of treating syphilis and gonorrhea in New York City. By Jacob A. Goldberg. Vol. 19, September 1938. 12 pages.
98. Presidential address, American Medical Association, 1876. By J. Marion Sims. Vol. 19, October 1938. 13 pages.
99. The chance of acquiring syphilis and the frequency of its disastrous outcome. By R. A. Vonderlehr and Lida J. Usilton. Vol. 19, November 1938. 9 pages.
100. Cooperative clinical studies in the treatment of syphilis: Tabes dorsalis. By Paul A. O'Leary, Harold N. Cole, Joseph Earle Moore, John H. Stokes, Udo J. Wile, Thomas Parran, R. A. Vonderlehr, and Lida J. Usilton. Vol. 19, November 1938. 30 pages.
101. Serology of syphilis in relation to the Chicago syphilis control project. By Reuben L. Kahn. Vol. 19, December 1938. 6 pages.
102. Simple method of determining attendance and delinquency in a syphilis clinic. By R. H. Kampmeier. Vol. 19, December 1938. 4 pages.
103. Progress in venereal disease control in the States, June 30, 1938. Vol. 19, December 1938. 3 pages.
104. Effect of tuberculosis on serologic reactions for syphilis. By Thomas Parran and Kendall Emerson. Vol. 20, January 1939. 5 pages.
105. Serologic reactions for syphilis in blood-transfusion donors. By A. E. Keller and W. S. Leathers. Vol. 20, January 1939. 4 pages.
106. Sulfanilamide therapy in gonorrhea. By John E. Dees and Hugh H. Young. Vol. 20, February 1939. 8 pages.
107. Making gold sol for cerebrospinal fluid tests. By Benjamin S. Levine. Vol. 20, February 1939. 2 pages.
108. Hospital, clinic, and laboratory costs of syphilis in Buffalo, N. Y., with a comparison of similar costs in Baltimore, Md. By W. A. Brumfield, Jr. Vol. 20, March 1939. 12 pages.
109. The role of the physician in the control of syphilis. By C. W. Barnett. Vol. 20, March 1939. 5 pages.
110. Cost and loss from syphilitic blindness in the United States. By C. E. Rice. Vol. 20, April 1939. 5 pages.

Venereal Disease Folder

3. You can end this sorrow. 4 pages.

Supplements to Venereal Disease Information

8. The gonococcus and gonococcal infections. 78 pages.
9. The serodiagnosis of syphilis. 224 pages.

DEATHS DURING WEEK ENDED JULY 22, 1939

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 22, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	7,198	7,282
Average for 3 prior years	[1] 7,488	
Total deaths, first 29 weeks of year	251,432	244,236
Deaths under 1 year of age	454	[1] 531
Average for 3 prior years	[1] 552	
Deaths under 1 year of age, first 29 weeks of year	14,950	15,400
Data from industrial insurance companies:		
Policies in force	66,974,598	69,062,540
Number of death claims	10,937	10,681
Death claims per 1,000 policies in force, annual rate	8.5	8.1
Death claims per 1,000 policies, first 29 weeks of year, annual rate	10.8	9.5

[1] Data for 86 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (----) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Cases of certain diseases reported by telegraph by State health officers for the week ended July 29, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	1	0	----	----	12	----	139	23	16	16
New Hampshire	0	0	1	0	----	----	----	----	61	6	1	2
Vermont	0	0	0	0	----	----	----	----	509	38	12	7
Massachusetts	1	1	2	6	----	----	----	----	125	106	86	94
Rhode Island	0	0	0	1	----	----	----	----	206	27	4	5
Connecticut	6	2	3	3	----	----	4	----	137	46	18	32
MID. ATL.												
New York	3	8	16	26	[1]2	[1]3	[1]1	[1]1	111	278	478	354
New Jersey	7	6	7	7	1	1	2	2	21	18	56	125
Pennsylvania	8	15	13	13	----	----	----	----	23	45	83	242
E. NO. CEN.												
Ohio	3	4	27	27	4	5	----	7	15	20	106	226
Indiana	0	0	6	9	3	2	3	3	1	1	8	20
Illinois	10	16	34	22	4	6	10	6	7	10	86	161
Michigan [2]	7	7	7	8	1	1	----	----	77	73	226	128
Wisconsin	0	0	5	3	16	9	19	19	128	73	253	253
W. NO. CEN.												
Minnesota	0	0	0	3	2	1	1	1	37	19	64	31
Iowa	0	0	4	4	----	----	----	----	41	20	51	15
Missouri	1	1	2	6	----	----	27	13	1	1	8	14
North Dakota	29	4	1	0	----	----	8	----	0	0	24	24
South Dakota	30	4	1	1	----	----	----	----	8	1	----	1
Nebraska	4	1	0	1	----	----	----	----	11	3	8	5
Kansas	3	1	5	3	8	3	----	2	36	13	15	1

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended July 29, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median
SO. ATL.												
Delaware	0	0	0	0					59	3	1	1
Maryland [1]	6	2	8	8	9	3	2	1	34	11	12	12
Dist. of Col	40	5	4	2			1		73	9	3	5
Virginia	37	20	4	5	51	27			107	57	58	58
West Virginia	11	4	4	5	8	3	10	9	11	4	19	21
North Carolina [1]	31	21	20	13			6	1	39	27	121	62
South Carolina [1]	8	3	2	2	188	69	66	40	0	0	9	6
Georgia [1]	25	15	11	10	12	7			12	7		
Florida [1]	12	4	3	6	6	2			33	11	9	1
E. SO. CEN.												
Kentucky	14	8	5	5	3	2	2	1	7	4	15	35
Tennessee	5	3	5	5	12	7	7	7	28	16	5	8
Alabama [1]	21	12	17	12	5	3	17	3	32	18	49	12
Mississippi [1]	41	16	11	9								
W. SO. CEN.												
Arkansas	7	3	12	3	10	4	15	5	47	19	4	2
Louisiana [1]	15	6	14	9	15	6	6	6	7	3	4	6
Oklahoma	6	3	3	3	14	7	19	5	26	13	34	3
Texas [1]	9	11	24	24	7	9	51	26	31	37	16	34
MOUNTAIN												
Montana	0	0	0	0					150	16	17	11
Idaho	10	1	0	0			4	2	10	1	21	4
Wyoming	44	2	0	0	22	1			393	18	5	5
Colorado	77	16	6	6	24	5			67	14	21	21
New Mexico	37	3	2	3					12	1	2	17
Arizona	0	0	1	1	98	8	16	10	12	1	26	5
Utah [1]	30	3	3	0					119	12	32	7
PACIFIC												
Washington	3	1	1	1					518	168	16	31
Oregon	0	0	0	0	40	8	9	9	368	74	15	15
California [1]	13	16	18	22	6	7	12	10	145	177	275	155
Total	10	248	313	313	10	209	330	251	62	1,542	2,342	2,342
30 weeks	15	11,220	13,410	14,273	237	150,757	45,046	103,251	466	345,945	756,518	663,397

Divison and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	0	0	0	0	0	1	24	4	5	9
New Hampshire	0	0	0	0	0	0	0	0	0	0	1	1
Vermont	0	0	0	0	0	0	0	0	27	2	5	4
Massachusetts	0	0	2	2	2.4	2	3	8	26	22	48	47
Rhode Island	0	0	0	0	0	0	1	0	0	0	4	2
Connecticut	0	0	0	0	3	1	1	1	27	9	14	10
MID. ATL.												
New York	0.4	1	5	5	4	11	5	9	29	72	69	112
New Jersey	0	0	2	2	4	3	0	2	27	23	16	16
Pennsylvania	4	7	1	6	2	4	0	3	37	72	48	100

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended July 29, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median
E. NO. CEN.												
Ohio	0	0	0	3	2.3	3	5	6	42	55	75	75
Indiana	0	0	0	2	0	0	0	2	31	21	15	21
Illinois	0	0	3	4	5	7	3	7	42	64	75	80
Michigan [3]	1.1	1	1	1	31	29	2	6	73	69	79	76
Wisconsin	0	0	3	1	0	0	0	1	54	31	56	56
W. NO. CEN.												
Minnesota	0	0	0	0	8	4	0	0	97	50	29	25
Iowa	0	0	0	0	0	0	1	1	26	13	18	19
Missouri	1.3	1	1	0	4	3	1	1	8	6	13	18
North Dakota	0	0	0	0	7	1	0	0	15	2	9	7
South Dakota	0	0	1	0	0	0	2	0	60	8	8	6
Nebraska	0	0	0	1	8	2	0	0	11	3	1	10
Kansas	2.8	1	0	1	8	3	1	2	64	23	30	18
SO. ATL.												
Delaware	20	1	0	0	0	0	0	0	98	5	1	1
Maryland [3]	0	0	0	0	0	0	0	1	31	10	12	12
Dist. of Col	8	1	0	1	0	0	0	0	24	3	3	5
Virginia	1.9	1	1	2	6	3	4	4	21	11	11	11
West Virginia	5	2	1	1	0	0	0	1	37	10	13	15
North Carolina [3]	0	0	1	0	12	8	2	2	22	15	14	15
South Carolina [3]	2.7	1	1	0	33	12	3	1	22	8	1	2
Georgia [3]	0	0	0	0	8	5	3	2	5	3	9	6
Florida [3]	0	0	0	0	6	2	1	1	15	5	1	1
E. SO. CEN.												
Kentucky	1.7	1	4	3	7	4	1	10	19	11	9	13
Tennessee	1.8	1	1	1	4	2	1	6	18	10	13	10
Alabama [3]	7	4	1	2	4	2	7	4	30	17	10	8
Mississippi [3]	0	0	0	0	0	0	1	2	10	4	4	5
W. SO. CEN.												
Arkansas	0	0	0	0	2.5	1	3	0	20	8	5	3
Louisiana [3]	0	0	0	0	0	0	3	1	5	2	7	5
Oklahoma	0	0	0	0	6	3	0	0	12	6	7	10
Texas [3]	4	5	1	1	8	10	2	2	6	7	20	20
MOUNTAIN												
Montana	0	0	0	0	0	0	0	0	94	10	5	5
Idaho	0	0	0	0	0	0	0	0	10	1	2	3
Wyoming	0	0	0	0	0	0	0	0	87	4	1	3
Colorado	5	1	0	0	5	1	0	0	53	11	20	18
New Mexico	0	0	0	0	0	0	0	1	99	8	3	4
Arizona	0	0	0	0	37	3	0	0	0	0	3	1
Utah [3]	0	0	0	0	10	1	0	0	40	4	11	9
PACIFIC												
Washington	0	0	0	1	0	0	0	0	28	9	13	14
Oregon	0	0	0	0	5	1	0	0	50	10	6	16
California [3]	0	0	1	5	38	46	5	21	43	82	62	67
Total	1.2	29	31	67	7	177	60	257	32	793	884	1,020
30 weeks	1.7	1,288	2,039	3,946	1.8	1,334	728	1,897	152	114,282	134,728	162,236

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended July 29, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases
NEW ENGLAND											
Maine	0	0	0	0	6	1	2	2	260	43	31
New Hampshire	0	0	0	0	10	1	1	0	20	2	0
Vermont	0	0	0	0	0	0	1	1	469	35	31
Massachusetts	0	0	0	0	4	3	1	3	95	81	92
Rhode Island	0	0	0	0	8	1	3	0	198	26	0
Connecticut	0	0	0	0	12	4	2	2	184	62	72
MIDDLE ATLANTIC											
New York	0	0	0	0	4	10	20	14	168	420	570
New Jersey	0	0	0	0	12	10	6	2	302	254	294
Pennsylvania	0	0	0	0	5	9	15	15	185	364	177
EAST NORTH CENTRAL											
Ohio	4	5	1	0	11	14	7	22	241	313	377
Indiana	10	7	9	2	6	4	17	15	171	115	18
Illinois	1	1	5	4	15	23	19	19	255	389	463
Michigan [3]	20	19	1	1	2	2	5	11	169	160	440
Wisconsin	2	1	0	3	0	0	2	2	373	212	337
WEST NORTH CENTRAL											
Minnesota	8	4	9	3	4	2	0	0	116	60	32
Iowa	14	7	3	5	20	10	4	2	41	20	18
Missouri	5	4	4	1	18	14	11	25	41	32	15
North Dakota	7	1	5	1	0	0	1	1	197	27	48
South Dakota	8	1	2	1	0	0	0	0	8	1	12
Nebraska	19	5	0	0	0	0	0	1	92	24	9
Kansas	0	0	0	1	17	6	2	7	45	16	65
SOUTH ATLANTIC											
Delaware	0	0	0	0	0	0	3	0	157	8	3
Maryland [3]	0	0	0	0	15	5	6	12	170	55	24
Dist. of Col	0	0	0	0	16	2	1	3	356	44	4
Virginia	0	0	0	0	43	23	39	37	178	95	93
West Virginia	0	0	0	0	54	20	10	12	35	13	28
North Carolina [3]	0	0	0	0	31	21	19	23	251	172	199
South Carolina [3]	0	0	0	0	66	24	16	16	158	58	31
Georgia [3]	0	0	0	0	65	39	46	35	17	10	56
Florida [3]	0	0	0	0	9	3	2	2	21	7	9
EAST SOUTH CENTRAL											
Kentucky	2	1	1	0	64	37	37	37	92	53	54
Tennessee	0	0	1	0	30	17	28	44	168	95	20
Alabama [3]	0	0	1	0	44	25	18	20	70	40	31
Mississippi [3]	0	0	0	0	15	6	15	16	----	----	----
WEST SOUTH CENTRAL											
Arkansas	5	2	6	0	74	30	37	37	69	28	17
Louisiana [3]	0	0	0	0	94	39	23	32	2	1	41
Oklahoma	4	2	5	0	52	26	34	33	6	3	60
Texas [3]	1	1	8	0	56	67	78	72	99	120	126
MOUNTAIN											
Montana	0	0	2	3	19	2	3	2	103	11	54
Idaho	0	0	3	2	10	1	6	0	0	0	8
Wyoming	0	0	0	0	0	0	0	0	44	2	8
Colorado	5	1	2	0	14	3	4	5	231	48	54
New Mexico	0	0	1	0	74	6	4	6	383	31	19
Arizona	12	1	1	0	37	3	0	0	37	3	16
Utah [3]	0	0	0	0	20	2	12	1	516	52	71

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended July 29, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases	1934–38, median	July 29, 1939, rate	July 29, 1939, cases	July 30, 1938, cases
PACIFIC											
Washington	6	2	29	8	3	1	3	3	46	15	50
Oregon	0	0	6	5	20	4	6	5	30	6	25
California [2]	9	11	28	1	11	14	13	11	109	133	228
Total	3	76	133	64	21	534	582	640	152	3,759	4,430
30 weeks	11	8,576	12,526	5,930	7	5,600	6,398	6,398	158	117,164	130,272

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended July 29, 1939, 90 cases as follows: North Carolina, 8; South Carolina, 3; Georgia, 31; Florida, 6; Alabama, 17; Louisiana, 1; Texas, 23; California, 1.

ROCKY MOUNTAIN SPOTTED FEVER

Cases reported by States, Feb. 26 to Aug. 5, 1939

State	Feb. 26 to Mar. 25	Mar. 26 to Apr. 22	Apr. 23 to May 20	May 21 to June 17	June 18 to July 15	Week ended July 22	Week ended July 29	Week ended Aug. 5
Eastern:								
New York				3	3			
New Jersey				4	8	1	2	3
Pennsylvania				6	3	1		2
Delaware				3				
Maryland			7	13	11	5	2	11
District of Columbia			2	2	2	1	1	
Virginia			1	13	10	1	4	3
North Carolina				3	13	5	2	4
Georgia					1		1	
Central:								
Ohio				3	2		2	2
Indiana				2	1			1
Illinois			1	1	5	2		1
Tennessee			1		3	3	1	
Iowa			1	10	9	2		2
Missouri				1			3	1
Western:								
Montana	[1] 2	2	8	5	1		1	
Idaho		4	7	4	5			
Wyoming		3	14	16	5	3		2
Colorado		2	3	9	4			
Utah		2	5	5	6	2		
Washington		2	3	2				
Oregon		9	16	7	2			

[1] 1 other case was reported in Montana as occurring in February, exact date not given.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Diphtheria	Influenza	Malaria	Measles	Meningitis, meningococcus	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
January 1939										
Idaho	6	8		234	1		0	70	50	4
April 1939										
Puerto Rico	27	43	1,084	8	0	2	0		0	68
May 1939										
Alaska	1	27		297	0		0		0	3
New Mexico	5	16	5	66	2	2	0	36	5	3
South Carolina	72	1,460	926	58		201	83	11	0	19
June 1939										
District of Columbia	14	1		660	1		0	21	0	2
Kansas	8	7	4	179	1	3	1	129	13	9
Massachusetts	8			3,927	5	3	3	441	0	17
Montana	1	34	2	374	0		1	27	7	5
Nevada	1			50	0	1	0	2	0	0
New Mexico	10	4	1	51	5		1	36	2	18
North Carolina	33	3	31	1,094	4	54	9	65	4	45
North Dakota	4	157		64	0		0	14	3	5
Oregon	3	67	3	299	0		1	46	6	1
South Carolina	35	684	1,301	67		188	106	11	0	48
Washington	6	5		3,445	0		0	80	3	128
Wyoming	2			186	0		0	12	7	0

January 1939

Idaho:	Cases
Chickenpox	103
German measles	1
Mumps	61
Septic sore throat	3
Vincent's infection	2
Whooping cough	13

April 1939

Puerto Rico:	
Chickenpox	56
Dysentery	6
Filariasis	1
Leprosy	3
Mumps	2
Ophthalmia neonatorum	3
Puerperal septicemia	7
Tetanus	12
Tetanus, infantile	1
Whooping cough	166

May 1939

Chickenpox:	
Alaska	46
New Mexico	116
South Carolina	138
Conjunctivitis:	
New Mexico	1
Diarrhea:	
South Carolina	1,017
Dysentery:	
New Mexico (amoebic)	2
New Mexico (bacillary)	1
New Mexico (undefined)	3
South Carolina (amoebic)	4
German measles:	
New Mexico	2
South Carolina	9

May 1939—Continued

	Cases
Hookworm disease:	
South Carolina	115
Impetigo contagiosa:	
Alaska	24
Mumps:	
Alaska	1
New Mexico	15
South Carolina	257
Ophthalmia neonatorum:	
New Mexico	2
South Carolina	5
Puerperal septicemia:	
New Mexico	3
Rabies in animals:	
New Mexico	15
South Carolina	25
Septic sore throat:	
New Mexico	18
South Carolina	3
Tetanus:	
New Mexico	1
Trachoma:	
New Mexico	2
Tularaemia:	
South Carolina	2
Typhus fever:	
South Carolina	6
Undulant fever:	
New Mexico	1
South Carolina	1
Whooping cough:	
Alaska	12
New Mexico	164
South Carolina	361

June 1939

Chickenpox:	
District of Columbia	38
Kansas	132
Massachusetts	850

June 1939—Continued

Chickenpox—Continued.	Cases
Montana	93
New Mexico	31
North Carolina	228
North Dakota	52
Oregon	80
South Carolina	119
Washington	584
Wyoming	19
Colorado tick fever:	
Wyoming	2
Diarrhea:	
New Mexico	2
South Carolina	1,923
Dysentery:	
Massachusetts (amoebic)	1
Massachusetts (bacillary)	1
Montana (amoebic)	2
Montana (unspecified)	1
New Mexico (amoebic)	5
New Mexico (bacillary)	1
New Mexico (unspecified)	1
North Carolina (bacillary)	5
North Dakota (bacillary)	1
Oregon (amoebic)	1
South Carolina (amoebic)	2
Washington (amoebic)	3
Washington (bacillary)	2
Encephalitis, epidemic or lethargic:	
Kansas	4
Massachusetts	2
Montana	1
North Dakota	1
Oregon	1

Summary of monthly reports from States—Continued

June 1939—Continued

	Cases
Food poisoning:	
New Mexico	8
German measles:	
Kansas	9
Massachusetts	75
North Carolina	18
North Dakota	6
South Carolina	4
Washington	7
Wyoming	22
Hookworm disease:	
South Carolina	98
Impetigo contagiosa:	
Kansas	12
Montana	2
Oregon	16
Mumps:	
Kansas	337
Massachusetts	501
Montana	40
Nevada	6
New Mexico	6
North Dakota	1
Oregon	64
South Carolina	146
Washington	133
Wyoming	120
Ophthalmia neonatorum:	
Kansas	1
Massachusetts	88
South Carolina	8
Rabies in animals:	
New Mexico	4
Oregon	2
South Carolina	29
Washington	40

June 1939—Continued

	Cases
Rabies in man:	
Kansas	1
Rocky Mountain spotted fever:	
District of Columbia	2
Massachusetts	1
Montana	1
Nevada	1
North Carolina	9
Oregon	4
Washington	1
Wyoming	18
Scabies:	
Kansas	3
Oregon	5
Septic sore throat:	
Kansas	11
Massachusetts	7
Montana	5
New Mexico	6
North Carolina	2
North Dakota	3
Oregon	13
Washington	3
Wyoming	1
Tetanus:	
Kansas	1
Massachusetts	1
Montana	1
South Carolina	1
Trachoma:	
Kansas	2
Montana	3
North Dakota	2
Oregon	1

June 1939—Continued

	Cases
Trichinosis:	
Massachusetts	1
Tularaemia:	
New Mexico	1
South Carolina	2
Washington	1
Wyoming	1
Typhus fever:	
North Carolina	6
South Carolina	4
Undulant fever:	
Kansas	9
Massachusetts	4
North Carolina	3
North Dakota	1
Oregon	2
South Carolina	2
Washington	2
Wyoming	1
Vincent's infection:	
Kansas	8
North Dakota	3
Oregon	8
Washington	2
Whooping cough:	
District of Columbia	147
Kansas	97
Massachusetts	551
Montana	36
New Mexico	79
North Carolina	1,074
North Dakota	36
Oregon	88
South Carolina	277
Washington	67
Wyoming	4

PLAGUE INFECTION IN MONTANA, WASHINGTON, AND WYOMING

Under date of July 27, 1939, Senior Surgeon C. R. Eskey reported plague infection found in Montana, Washington, and Wyoming as follows:

IN A GROUND SQUIRREL AND IN FLEAS FROM GROUND SQUIRRELS IN BEAVERHEAD COUNTY, MONTANA

In tissue from 1 ground squirrel, *C. columbianus*, shot July 15, 9 miles west of Wisdom, and in a pool of 43 fleas from 60 ground squirrels, *C. columbianus*, shot July 15, 10 miles west of Wisdom.

IN FLEAS FROM GROUND SQUIRRELS IN SPOKANE COUNTY, WASHINGTON

In a pool of 62 fleas from 31 ground squirrels, *C. columbianus*, shot June 27, on a ranch on the south side of Turnbull Slough.

IN FLEAS FROM PRAIRIE DOGS IN SWEETWATER COUNTY, WYOMING

In a pool of 15 fleas from 36 prairie dogs, *Cyn. leucurus*, shot July 3, 2 to 4 miles south of Eden. This is stated to be the first evidence of plague infection reported in Sweetwater County.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 22, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	103	29	12	1,045	314	382	6	367	64	1,407	----
Current week [1]	56	25	7	589	243	236	2	297	68	1,406	----
Maine:											
Portland	0	----	0	1	1	1	0	0	0	1	20
New Hampshire:											
Concord	0	----	0	0	0	0	0	0	0	0	8
Manchester	0	----	0	0	1	0	0	0	0	0	16
Nashua	0	----	0	0	0	0	0	0	0	0	5
Vermont:											
Barre	0	----	0	0	0	0	0	0	0	12	4
Burlington	0	----	0	0	0	0	0	0	0	0	10
Rutland	0	----	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston	3	----	0	44	10	7	0	6	1	28	203
Fall River	0	----	0	0	0	0	0	1	0	0	30
Springfield	0	----	0	1	0	1	0	1	0	1	31
Worcester	0	----	0	11	3	1	0	1	0	15	31
Rhode Island:											
Pawtucket	0	----	0	2	0	0	0	0	0	0	13
Providence	0	----	0	25	4	3	0	0	1	13	49
Connecticut:											
Bridgeport	0	1	0	2	2	0	0	0	0	0	21
Hartford	0	----	0	1	0	2	0	0	0	8	39
New Haven	0	----	0	14	3	0	0	0	0	5	41
New York:											
Buffalo	0	----	0	9	10	5	0	4	1	14	121
New York	9	3	1	63	32	19	0	59	4	163	1,170
Rochester	0	----	0	12	1	1	0	2	1	2	58
Syracuse	0	----	0	46	1	4	0	0	0	11	46
New Jersey:											
Camden	0	----	0	0	0	3	0	1	0	8	24
Newark	0	1	0	1	3	1	0	8	0	62	78
Trenton	0	----	0	0	0	0	0	6	0	0	33
Pennsylvania:											
Philadelphia	3	----	0	21	10	13	0	22	8	130	357
Pittsburgh	0	1	0	4	8	8	0	6	0	56	124
Reading	0	----	0	1	0	2	0	1	1	1	21
Scranton	0	----	----	0	----	1	0	----	0	7	----
Ohio:											
Cincinnati	0	----	0	0	4	6	0	4	0	13	100
Cleveland	0	1	0	2	4	7	0	12	0	86	157
Columbus	0	----	0	1	4	0	0	1	1	17	71
Toledo	0	----	0	4	0	0	0	5	0	60	60
Indiana:											
Anderson	0	----	0	0	2	0	1	0	0	3	11
Fort Wayne	0	----	0	0	0	1	0	1	0	0	27
Indianapolis	2	----	0	0	5	6	0	5	1	145	86
Muncie	0	----	0	0	0	1	0	0	0	0	11
South Bend	0	----	0	1	1	0	0	1	0	10	13
Terre Haute	0	----	0	0	3	0	0	1	0	0	28
Illinois:											
Alton	0	----	0	0	0	1	0	0	0	0	6
Chicago	11	1	1	8	9	38	0	36	1	129	554
Elgin	0	----	0	2	0	0	0	0	0	17	3
Moline	0	----	0	0	1	0	0	0	0	10	13
Springfield	0	----	0	0	1	0	0	1	1	5	15
Michigan:											
Detroit	4	----	0	18	3	20	0	10	1	85	215
Flint	0	----	0	3	1	2	1	0	0	2	19
Grand Rapids	0	----	0	4	1	1	0	1	0	3	21
Wisconsin:											
Kenosha	0	----	0	0	0	2	0	0	0	2	2
Madison	0	----	0	2	1	0	0	0	0	26	7
Milwaukee	0	1	1	6	1	8	0	0	0	24	80
Racine	0	----	0	1	0	0	0	0	0	4	15
Superior	0	----	0	2	0	0	0	0	0	0	11

[1] Figures for Wheeling and Tampa estimated; reports not received.

City reports for week ended July 22, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota:											
Duluth	0	----	0	2	2	3	0	0	0	0	17
Minneapolis	0	----	0	1	4	2	0	1	0	3	81
St. Paul	0	----	0	5	2	0	0	2	0	17	65
Iowa:											
Cedar Rapids	0	----	----	2	----	0	0	----	0	0	----
Davenport	0	----	----	0	----	0	0	----	0	0	----
Des Moines	0	----	0	0	0	4	5	0	0	6	28
Sioux City	0	----	----	0	----	0	0	----	0	1	----
Waterloo	0	----	----	1	----	0	0	----	0	2	----
Missouri:											
Kansas City	1	----	0	0	2	2	1	5	0	1	100
St. Joseph	0	----	0	0	7	1	0	0	0	1	34
St. Louis	0	----	0	0	7	4	0	4	7	28	188
North Dakota:											
Fargo	0	----	0	0	0	0	0	0	0	4	6
Grand Forks	0	----	----	0	----	1	0	----	0	0	----
Minot	0	----	----	1	----	0	0	----	0	0	----
South Dakota:											
Sioux Falls	0	----	0	0	0	6	0	0	0	0	10
Nebraska:											
Lincoln	0	----	0	0	----	1	0	----	0	28	----
Omaha	0	----	0	0	2	0	0	0	0	8	54
Kansas:											
Lawrence	0	----	0	0	0	0	0	0	0	0	3
Topeka	0	----	0	1	1	2	0	0	0	2	27
Wichita	0	----	0	6	3	0	0	0	1	0	38
Delaware:											
Wilmington	0	----	0	2	1	2	0	1	1	0	25
Maryland:											
Baltimore	1	1	1	2	7	3	0	10	0	42	182
Cumberland	0	----	0	0	0	0	0	0	0	0	8
Frederick	0	----	0	0	1	0	0	0	0	0	1
Dist. of Col.:											
Washington	1	1	1	14	10	0	0	9	3	37	145
Virginia:											
Lynchburg	1	----	0	3	0	0	0	0	1	31	9
Norfolk	0	----	0	0	1	2	0	1	0	0	36
Richmond	0	----	0	5	1	0	0	1	3	1	42
Roanoke	0	----	0	4	0	0	0	0	0	0	14
West Virginia:											
Charleston	0	----	0	0	0	0	0	1	3	0	5
Huntington	0	----	----	0	----	0	0	----	1	0	----
Wheeling	----	----	----	----	----	----	----	1	----	----	15
North Carolina:											
Gastonia	0	----	----	0	----	0	0	----	0	0	----
Raleigh	0	----	0	0	1	2	0	0	0	5	20
Wilmington	0	----	0	0	0	0	0	0	0	1	16
Winston-Salem	1	----	0	0	0	0	0	3	0	0	16
South Carolina:											
Charleston	0	2	0	0	1	0	0	2	3	0	13
Florence	0	----	0	0	2	0	0	0	0	0	11
Greenville	0	----	0	0	1	0	0	0	0	0	27
Georgia:											
Atlanta	0	5	1	1	6	3	0	9	3	1	84
Brunswick	0	----	0	0	0	0	0	0	0	0	3
Savannah	0	1	0	0	2	0	0	1	0	22	25
Florida:											
Miami	0	4	0	0	1	1	0	0	0	1	24
Tampa	----	----	----	----	----	----	----	----	----	----	----
Kentucky:											
Ashland	0	----	0	0	1	0	0	0	1	0	5
Covington	0	----	0	0	1	2	0	0	0	0	20
Lexington	0	----	0	2	1	0	0	1	1	0	21
Louisville	0	----	0	2	4	3	0	4	1	23	85
Tennessee:											
Knoxville	0	----	0	0	0	1	0	1	0	0	21
Memphis	0	----	0	0	4	0	0	5	4	25	77
Nashville	0	----	0	0	0	1	0	4	1	13	72
Alabama:											
Birmingham	0	----	0	2	2	0	0	1	2	9	72
Mobile	0	3	0	5	0	1	0	1	0	0	17
Montgomery	0	----	----	0	----	0	0	----	2	3	----

City reports for week ended July 22, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Arkansas:											
Fort Smith	0	----	----	0	----	0	0	----	3	0	----
Little Rock	1	----	0	0	2	0	0	1	1	0	4
Louisiana:											
Lake Charles	0	----	0	0	1	0	0	1	0	0	3
New Orleans	2	----	0	1	14	5	0	9	0	0	140
Shreveport	0	----	0	0	7	1	0	4	0	1	57
Oklahoma:											
Oklahoma City	0	----	0	1	1	1	0	1	0	0	37
Tulsa	0	----	----	0	----	1	0	----	3	0	----
Texas:											
Dallas	2	----	0	4	1	1	0	3	6	4	49
Fort Worth	0	----	0	1	3	1	0	1	1	0	47
Galveston	0	----	0	0	0	0	0	0	0	0	11
Houston	1	----	0	3	5	0	0	10	1	6	84
San Antonio	0	----	0	0	1	0	0	6	4	1	67
Montana:											
Billings	0	----	0	0	0	1	0	0	0	2	8
Great Falls	0	----	0	13	0	0	0	0	0	0	7
Helena	0	----	0	1	0	1	0	0	0	0	2
Missoula	0	----	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	0	----	0	0	1	0	0	0	0	0	6
Colorado:											
Colorado Springs	0	----	0	0	0	1	1	0	0	0	9
Denver	7	----	0	7	4	11	0	0	0	16	79
Pueblo	0	----	0	1	0	0	0	0	0	13	7
New Mexico:											
Albuquerque	0	----	0	0	0	0	0	3	0	1	15
Utah:											
Salt Lake City	0	----	0	4	3	4	0	0	0	19	45
Washington:											
Seattle	0	----	1	96	1	1	0	3	0	5	65
Spokane	0	----	0	10	1	2	0	2	0	0	42
Tacoma	0	----	0	7	3	0	0	0	0	0	32
Oregon:											
Portland	4	----	0	2	1	0	1	2	0	2	61
Salem	0	----	----	0	----	0	0	----	1	0	----
California:											
Los Angeles	5	3	0	67	7	17	0	0	1	21	295
Sacramento	0	----	0	3	0	1	0	3	1	2	37
San Francisco	1	----	0	3	2	3	0	4	0	7	142

State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths	
Rhode Island:			
Providence	1	0	0
New York:			
Buffalo	0	0	2
New York	1	1	3
New Jersey:			
Newark	1	1	0
Pennsylvania:			
Philadelphia	1	2	3
Pittsburgh	0	0	2
Scranton	2	0	0
Illinois:			
Chicago	0	0	6
Michigan:			
Detroit	0	0	19
Minnesota:			
St. Paul	0	0	1
Missouri:			
Kansas City	0	0	1
St. Joseph	0	0	1
Nebraska:			
Omaha	0	0	1
Virginia:			
Norfolk	0		1
West Virginia:			
Huntington	1	0	0
South Carolina:			
Charleston	0	0	5
Georgia:			
Atlanta	0	0	1
Florida:			
Miami	0	0	1
Tennessee:			
Nashville	1	1	1
Louisiana:			
Shreveport	0	1	0
Texas:			
Houston	1	0	0
Colorado:			
Denver	0	0	1
California:			
Los Angeles	0	0	6

Encephalitis, epidemic or lethargic.—Cases: New York, 1; New Orleans, 1; Los Angeles, 1.
Pellagra.—Cases: Boston, 1; Winston-Salem, 1; Charleston, S. C., 1; Atlanta, 1; Savannah, 2; Louisville, 1; Birmingham, 3; Dallas, 1; San Francisco, 1.
Typhus fever.—Cases: Charleston, S. C., 1; Savannah, 2; Lake Charles, 1; Galveston, 2; Houston, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended July 8, 1939.—During the week ended July 8, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	2			1		4
Chickenpox		1		65	269	23	39	58	23	478
Diphtheria			3	54	7	10		1		75
Influenza					2	1			15	18
Measles			3	389	609	67		7	2	1,077
Mumps				13	25	8		1	4	51
Pneumonia		1			16		1		10	28
Poliomyelitis					9					9
Scarlet fever	1	5	13	57	87	16	8	12	1	200
Trachoma							2			2
Tuberculosis	2	14	27	119	62	5	25	3		257
Typhoid and paratyphoid fever		1	1	14	6		1			23
Whooping cough		1	2	53	121	16	16	63	17	289

EGYPT

Vital statistics—Third and fourth quarters 1938.—The following table shows the numbers of births and deaths for the third and fourth quarters of 1938 in all places in Egypt having a health bureau.

	Third quarter	Fourth quarter		Third quarter	Fourth quarter
Number of live births	48,983	61,447	Deaths from:—Continued		
Live births per 1,000 population	41.2	51.7	Diphtheria	121	232
Number of stillbirths	1,014	1,169	Dysentery	124	94
Number of deaths	46,383	31,684	Heart disease	1,830	1,345
Deaths per 1,000 population	39.1	26.7	Homicide	296	232
Deaths under 2 years of age	17,255	7,836	Influenza	32	21
Deaths under 2 years of age per 1,000 live births	352	128	Malaria	20	17
Deaths from:			Measles	394	30
Cancer	241	350	Nephritis	878	1,052
Cerebral hemorrhage, embolism and cerebral thrombosis	617	732	Pneumonia	3,583	3,294
Diabetes	229	202	Scarlet fever	2	
Diarrhea and enteritis (under 2 years of age)	10,914	3,195	Suicide	26	22
			Syphilis	131	90
			Tuberculosis (all forms)	677	612
			Typhoid fever	408	183
			Typhus fever	15	8
			Whooping cough	8	

SWEDEN

Communicable diseases—May 1939.—During the month of May 1939, cases of certain communicable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Poliomyelitis	4
Diphtheria	14	Scarlet fever	5,535
Dysentery	1	Syphilis	31
Gonorrhea	876	Typhoid fever	13
Paratyphoid fever	36	Undulant fever	12

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 28, 1939, pages 1409-1421. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

China—Shanghai.—During the week ended July 22, 1939, 2 cases of cholera were reported at Shanghai, China.

India—Karachi.—During the week ended July 22, 1 case of cholera was reported at Karachi, India.

French Indochina—Tonkin Province.—During the week ended July 22, 1 case of cholera was reported in Tonkin Province, French Indochina.

Smallpox

Eritrea—Massaua.—During the week ended June 17, 1 case of smallpox was reported at Massaua, Eritrea.

Senegal—Diourbel.—During the 10-day period ended June 20, 4 cases of smallpox were reported at Diourbel, Senegal.

Sudan (French).—During the 10-day period ended June 20, there were reported 8 cases of smallpox at Niafunke, and 19 cases at Macina, French Sudan.

Ivory Coast—Aboagourou.—During the 10-day period ended June 20, 10 cases of smallpox were reported at Aboagourou, Ivory Coast.

Portugal—Lisbon.—During the week ended July 15, 10 cases of smallpox were reported at Lisbon, Portugal.

Typhus Fever

Eritrea—Hamasien.—During the week ended June 17, 5 cases of typhus fever were reported at Hamasien, Eritrea.

Rumania—Bucharest.—During the period May 1 to 31, 1939, 40 cases of typhus fever were reported at Bucharest, Rumania.

Palestine—Jerusalem.—During the week ended June 17, 8 cases of typhus fever were reported at Jerusalem, Palestine.

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